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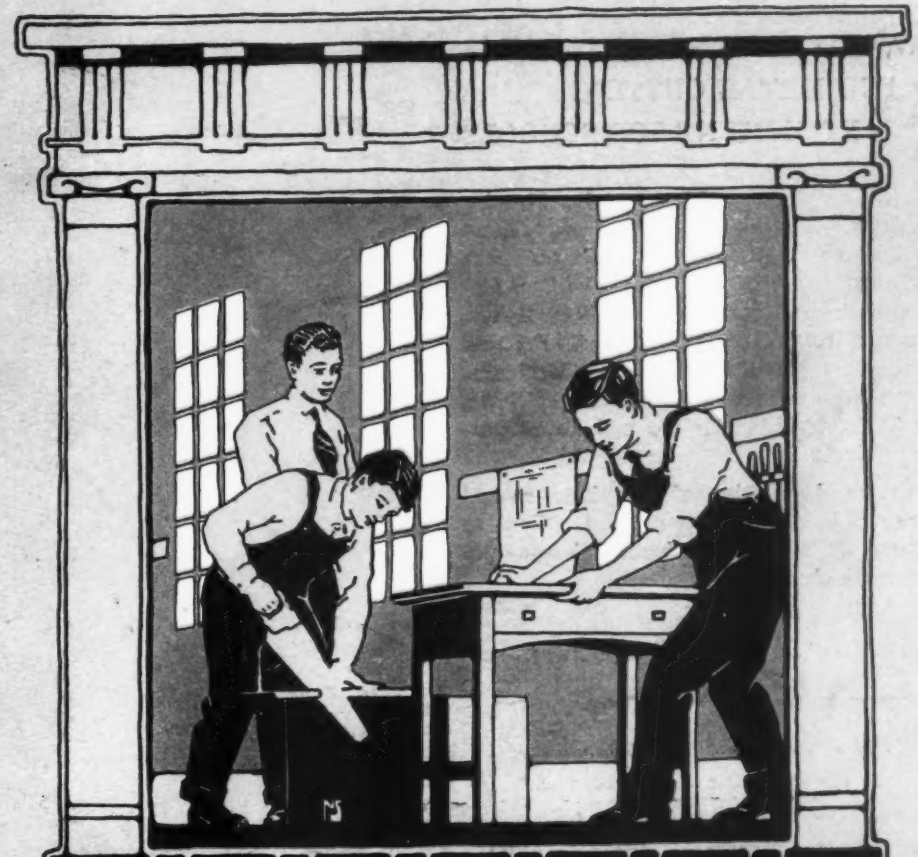
# The INDUSTRIAL-ARTS MAGAZINE



September 1923

The Bruce Publishing Company
Milwaukee Wisconsin

# ATKINS
## SILVER STEEL SAWS

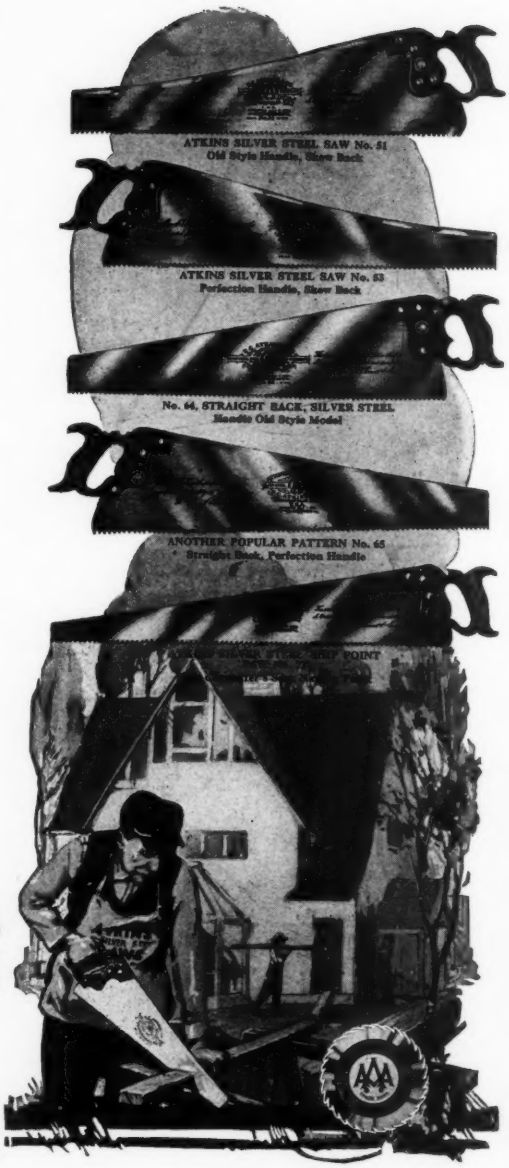
**SAW, SAW TOOL, MACHINE KNIFE AND METAL CUTTING EQUIPMENT FOR SCHOOLS**

SEND us your specifications for Circular Saws, Band Saws, Scroll Saws, Hand Saws, Compass Saws, Keyhole Saws, Cross Cut Saws, Saw Tools, Braces and Bits; Machine Knives, Matcher Bits, Dado Heads, Groovers, Hack Saw Blades and Frames, Metal Cutting Band and Hack Saw Machines. We are headquarters for all kinds of Saws, Saw Tools, Machine Knives and Metal Cutting products.

Literature descriptive of any item named above will be sent you on request. Write to our nearest factory or branch house and learn more about,

*"A Perfect Saw For Every Purpose"*

*Ask for "Saw Sense," "How To Care For And Use Cross Cut And Hand Saws," also "Saw Fitting For Best Results."*


ATKINS SILVER STEEL SAW No. 51
Old Style Handle, Skew Back
ATKINS SILVER STEEL SAW No. 53
Perfection Handle, Skew Back
No. 64, STRAIGHT BACK, SILVER STEEL
Handle Old Style Model
ANOTHER POPULAR PATTERN No. 65
Straight Back, Perfection Handle

## E.C. ATKINS & CO.

ESTABLISHED 1857 THE SILVER STEEL SAW PEOPLE

Home Office and Factory, INDIANAPOLIS, INDIANA

Canadian Factory, Hamilton Ontario

Machine Knife Factory, Lancaster N.Y.

*Branches Carrying Complete Stocks In The Following Cities:*

| | | |
|---|---|---|
| Atlanta | New Orleans | Seattle |
| Memphis | New York City | Paris, France |
| Chicago | Portland, Ore. | Sydney, N. S. W. |
| Minneapolis | San Francisco | Vancouver, B.C. |

# Choosing the Proper Finish Is Important

Johnson's Artistic Wood Finishes are now being used in nine tenths of the schools in United States and Canada. They are particularly adapted for manual training work as they may be applied by the youngest and most inexperienced pupils with good results.

## JOHNSON'S *ARTISTIC* WOOD FINISHES

The finishing of manual training models is assuming more and more importance every year. Surely it is a subject which should be given its share of attention, for a beautiful model may be ruined if improperly finished, whereas the defects of a poorly constructed model are minimized if well finished.

The finishes more popular among Training Instructors and Pupils are: Johnson's Wood Dye, Prepared Wax, Under Lac, Paste Wood Filler, Varnishes, Undercoat and Enamel.

Johnson's Artistic Wood Finishes are very easy to use. Boys in the Fifth and Sixth grades can use them successfully. Simple instructions are printed on every label.

## FREE—Book on Wood Finishing

Our Book is a valuable text book on Wood Finishing and should be in the hands of every instructor of Industrial and Vocational Education. It is full of information on finishing all wood—hard or soft—old or new. Tells how inexpensive soft wood, such as pine, cypress, fir, etc., can be finished so they are beautiful as hardwood.

This Book is the work of experts — profusely illustrated in color — includes color charts — gives covering capacities, etc. New edition is just off the press. We will gladly send it free.

## *Submit Your Problems to Our Individual Service Department*

We have a very attractive exhibit of wood panels finished with these products which we are glad to send, free and postpaid, to Manual Training instructors who will give it wall space in their shops.

At all times we are glad to furnish Manual Training Instructors with specially finished panels of wood for class room use, also with working samples. There is no obligation whatever connected with this offer. Don't hesitate to avail yourself of it.

S. C. JOHNSON & SON, Dept. I.A.-9, RACINE, WIS. (Canadian Factory — Brantford).

Please send me free and postpaid your text book on Wood Finishing. We usually buy finishing materials from

Dealer .....

My Name.....

My Address.....

City and State.....

# This popular two-speed drill helps make teaching easier

Mr. Punch says:

*"Give a student that Goodell-Pratt Breast Drill and see how eagerly he gets to work."*

Students like this Goodell-Pratt Breast Drill for several reasons. It's just the right size for school use, simple in operation, won't get out of order, has two speeds, and is a sturdy, easy-to-handle tool that helps to produce good work.

Malleable iron frame, black enameled. Enameled-iron, adjustable breast plate. Comfortable, polished hardwood handles.

All gear teeth are accurately machine cut; pinions are of steel. Spindle has a hardened end that runs in a hardened steel-cone bearing, to prevent wear.

All-steel chuck holds round shanks from 0 to ½ inch. Size of breast drill, 16 inches.

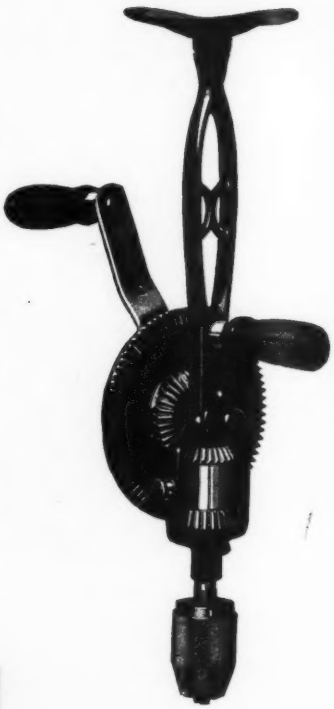
***Other tools for school use***

Every industrial school should have a copy of the Goodell-Pratt Catalog No. 15. It pictures and describes the complete line of 1500 Good Tools—many of which ought to be a part of every school's equipment. Each tool made as well as the most skilled toolsmiths in America can make it. Write for a copy. It's free.

GOODELL-PRATT COMPANY, Greenfield, Mass., U. S. A.

*Toolsmiths*

**GOODELL-PRATT**
**1500 GOOD TOOLS**



Breast Drill
No. 6
Price $5.60

## The Standard for 45 Years

Because it is scientifically designed, sets saws according to the best saw practice, is simple in operation and can be used by anyone, is made of the best materials, and is long lived (We have seen any number that have been in constant use for over 25 years).

"Saw Points," a booklet on "How to Joint, Set and File Saws" and used by many Manual Training Teachers as a Text Book, will be sent free to any teacher upon request.

**"Special" and No. 1 for Hand Saws not over 16 gauge.**
**No. 3 for Cross Cut and Circular Saws 14 to 20 gauge.**
**No. 4 for Double Toothed Saws 14 to 20 gauge.**
**No. 5 for Timber and Board Saws 6 to 14 gauge.**

**Our name Morrill and trade mark is stamped on every tool of our manufacture.**

## CHAS. MORRILL

94 La Fayette St. New York, N. Y.

## MAYDOLE HAMMERS
THE WORLD'S STANDARD

There are none better made—none better known. When you buy these hammers, you are certain of getting the best. They are used the world over.

Maydole Hammers are made of finest quality material, and guaranteed first-class in every respect.

**Write for our booklet of useful information, which every student should have. How many shall we send?**

## The David Maydole Hammer Company
NORWICH NEW YORK U. S. A.

# August Budde bought this Millers Falls Brace in 1882

## *Says Its "Good for 40 Years More."*

THIS old brace has done good work in its time—and lots of it. It belongs to August Budde, Paducah, Kentucky, who is naturally much attached to it. Mr. Budde writes as follows:—

**"In 1882, being then a young carpenter, I needed a brace. I went to a local hardware firm, Geo. O. Hart, and told them I wanted a good one. They sold me a small 6" brace made by the Millers Falls Company. I have used this brace constantly in my work since that time, and am using it now. *It is good for forty more years."***

MILLERS FALLS tools that have seen years of service—and are good for years more—can be found in every city and town in the United States — and in most foreign countries.

If you want a brace or a drill or hack saw that will last a lifetime, look for the name "Millers Falls" on the tools you buy. Every tool so marked is made of fine materials by men who know their business.

**Millers Falls Company**

**Millers Falls, Mass.**

***Manufacturers of Carpenters' Tools, Hack Saws and Automobile Tools***

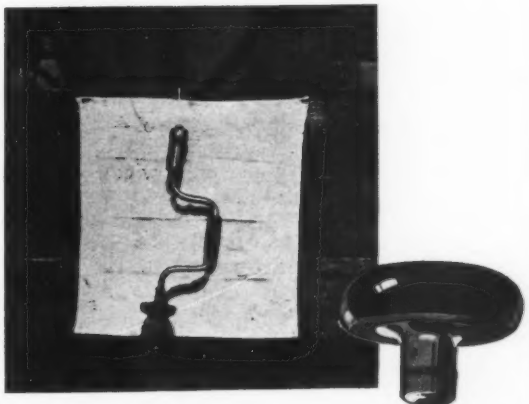


*Photo of Mr. Budde's Brace—from snapshot*

**Millers Falls Ratchet Brace No. 32**

*There is no brace better known to carpenters than Millers Falls No. 32. It will meet every boring requirement where bit shanks only are used.*

MILLERS FALLS TOOLS SINCE 1868

# THE JOHNSON FRICTION CLUTCH

## FOR NEW SCHOOLS

### Install a Johnson Lineshaft Drive in the Manual Training Department

The practical experience of hundreds of our customers has established their belief in the Johnson Clutch Drive as the ultimate method of power transmission.

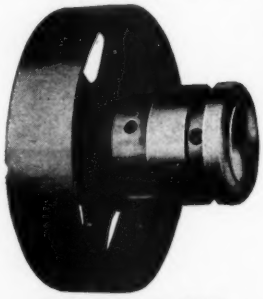
It replaces the countershaft, with its old-fashioned tight and loose pulleys, and its troublesome overhead belting.

It avoids the expense of individual motors, and the waste of current they involve.

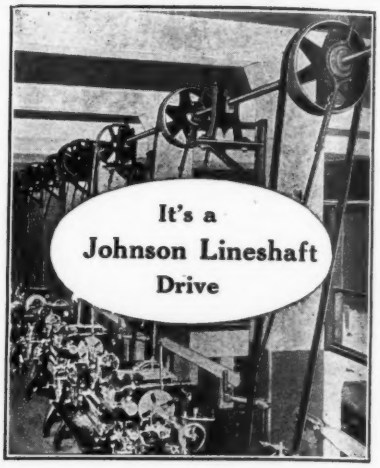
It substitutes reliable clutch control — economical in first cost, efficient in operation, durable under all kinds of service.

*"We are still using Johnson Clutches with very good success and have had them installed in our Nut Tapping Department for about ten years and at least half of that time they have been running night and day. We are also very greatly pleased with their operation in direct drives from lineshafts to lathes and other machines in our Machine Shop Departments."*

THE NATIONAL SCREW & TACK CO.
CLEVELAND, OHIO



Single Clutch, With Pulley Mounted.




An installation made ten years ago on Lodge & Shipley Lathes, still in perfect condition

**Friction Control Means Better Machinery**

We specialize in friction clutches alone and can supply the right clutch for any drive. Hundreds of standard sizes in stock to fit all shaft and pulley dimensions.

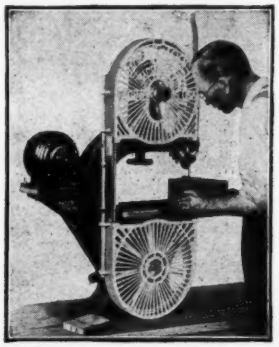
***Write for our stock list and Catalog "IAM"***

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

# Delivery NOW!

**Changes in schedules — increased enrollment — extended courses—where unforeseen changes of this kind make it necessary to add to your tool equipment we can give you immediate delivery.**

**The RACINE DUPLEX**



**is especially suited for school use — cuts all materials —wood, soft metal or steel.**

**We have increased our stock of Racine Duplex Band Saws in anticipation of rush orders for this popular piece of manual training equipment. Descriptive circular and prices on request.**

*Use "Racine" H. S. Wood and Metal Band Saw Blades and "Racine" H. S. Tungsten Power and Hand Hack Saw Blades.*

**RACINE TOOL & MACHINE CO.**
1403 JONES AVE.
Racine, Wisconsin, U. S. A.

*Manufacturers of the Famous Racine H. S. Metal Cutting Machines.*

**"STANDARD THE WORLD OVER"**

TRADE MARK

# "STAR" Hack Saws

**Always order STAR HACK SAWS—The Blade with a Reputation. We back it up with real sales helps—ask us to prove it!**

**CLEMSON BROS., Inc.**
**MIDDLETOWN, N. Y.**
**Makers Since 1883**

# *Making Men Out of Boys in Tacoma*

There's a basic truth in the adage that "Men are only boys grown tall." Particularly is this true in the use of machines. Teach a boy to know and appreciate the use of GOOD tools and you have made a craftsman. Proof of this is found in the products of our Manual Training Schools.

These pictures show three different views in the Manual Training Dept. of Tacoma Schools, with the Famous Woodworker in use in each one. Lower view shows jointer, band saw, borer, and shaper being used at same time.

Here's how the Manual Training Schools of Tacoma are making good craftsmen and doing it economically:

### *Read This Letter From Their Supervisor of Manual Training*

"Gentlemen:

"We have used your 'Famous Universal Woodworking Machine No. 30' with our boys in the prevocational classes of the 7th and 8th grades of the Tacoma schools during the past year and are well satisfied with the work that it has done. The machine has solved the problem of saving expense which is a point of vital importance in extending this work in the old style buildings. Furthermore it is a safe machine for boys to handle under careful supervision and we find it far superior in every way to the separate machines we have in some of our prevocational centers on account of the great amount of floor space it saves.

Yours very truly,

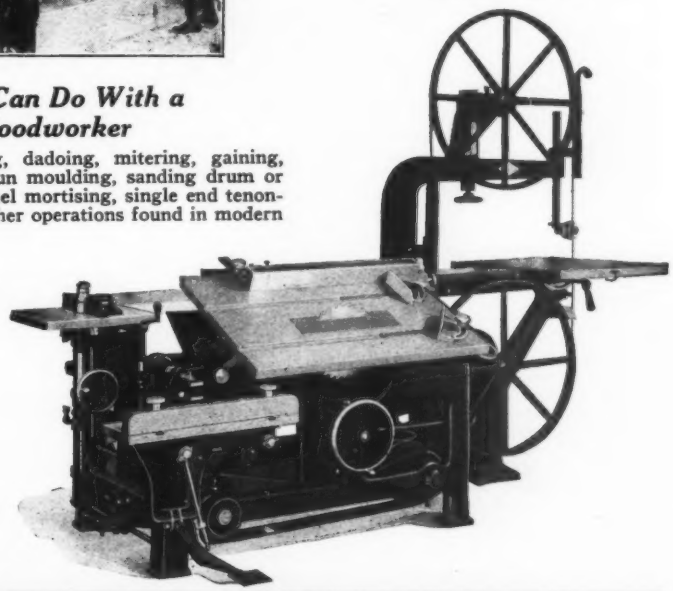
James B. Mitchell."

Supervisor of Manual Training and Prevocational Work in Tacoma Grade Schools.

### *Some of the Things You Can Do With a Famous Universal Woodworker*

Band sawing, ripping sawing, cross cutting, dadoing, mitering, gaining, grooving, re-sawing, hand jointing, planing, run moulding, sanding drum or disc shaping, panel raising, boring, hollow chisel mortising, single end tenoning tool and knife grinding, and a number of other operations found in modern workshops.

It is the great variety of work you can do on a Famous Woodworker which makes them so admirably adapted to the needs of Manual Training Schools. Think of being able to do all these THINGS ON ONE machine:—



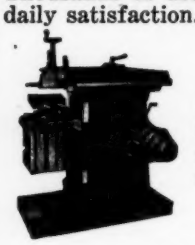
**Write today for information on the complete Famous Line of Machines which includes Band Saws, Saw Benches, Jointers, Planers, Swing Saws, Post Borers, Hollow Chisel Mortisers, Single End Tenoners, Shapers, and Lathes. Ask for special Bulletin for Manual Training Schools.**

**THE SIDNEY MACHINE TOOL COMPANY**
Dept. 409 Sidney, Ohio

# SHAPERS MILLERS ENGINE LATHES

14"x6'—$400.00
16"x6'— 450.00
With Quick Change Gear Box $85.00 extra

Moderate price machine tools — practically fool proof — ideally suited for school shops. Thousands in use all over the world giving daily satisfaction.



Descriptive catalogue and full particulars furnished upon request.

Industrial Education Department

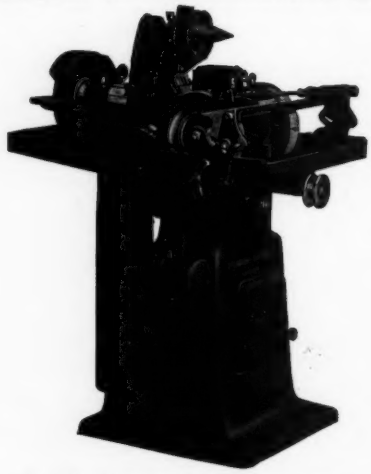
**THE JOHN STEPTOE CO.**

CINCINNATI :: :: OHIO

# MUMMERT-DIXON OILSTONE GRINDERS

The Modern Edge Tool Sharpening Machines

THE STANDARD FOR ALL INDUSTRIAL SCHOOLS



No. 481—Motor or Countershaft Drive.

An automatic attachment for grinding long knives can be furnished with this machine.

THE FIVE LEADING FEATURES

1. Coarse Oilstone Wheel
2. Fine Oilstone Wheel
3. Grinding Cone
4. Leather Wheel
5. Emery Wheel

ALL AT YOUR FINGERS' ENDS

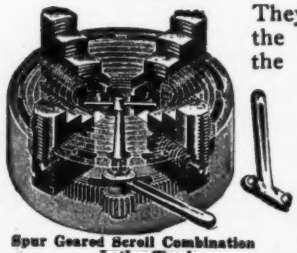
*Send for full descriptive bulletin*

**MUMMERT-DIXON CO.**
Hanover, Pa.

# DURABILITY — ACCURACY — STRENGTH

are striking features of

## Westcott Chucks



Spur Geared Scroll Combination Lathe Chuck

They are as essential in the schoolroom as in the commercial shop. The student who learns his trade using the very best of tools and equipment, is sure to benefit in the end.

In the case of chucks—
BUY WESTCOTT

**Mainly About Your Classes**

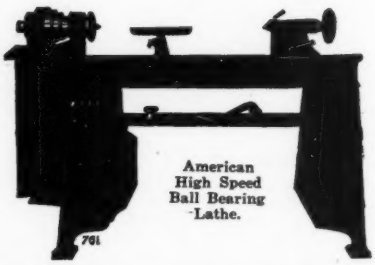
Little Giant Double Grip Drill Chuck

If you are not using Westcott Chucks now, you should certainly give your boys this advantage. Their best work can only be accomplished on the best equipment. Specify Westcott Chucks on your next order—in the meantime send for our catalogue.

*Manufacturers of chucks for every class of work.*

**WESTCOTT CHUCK COMPANY**
Oneida, New York

# Make This a *"No Accident"* Term



American High Speed Ball Bearing Lathe.

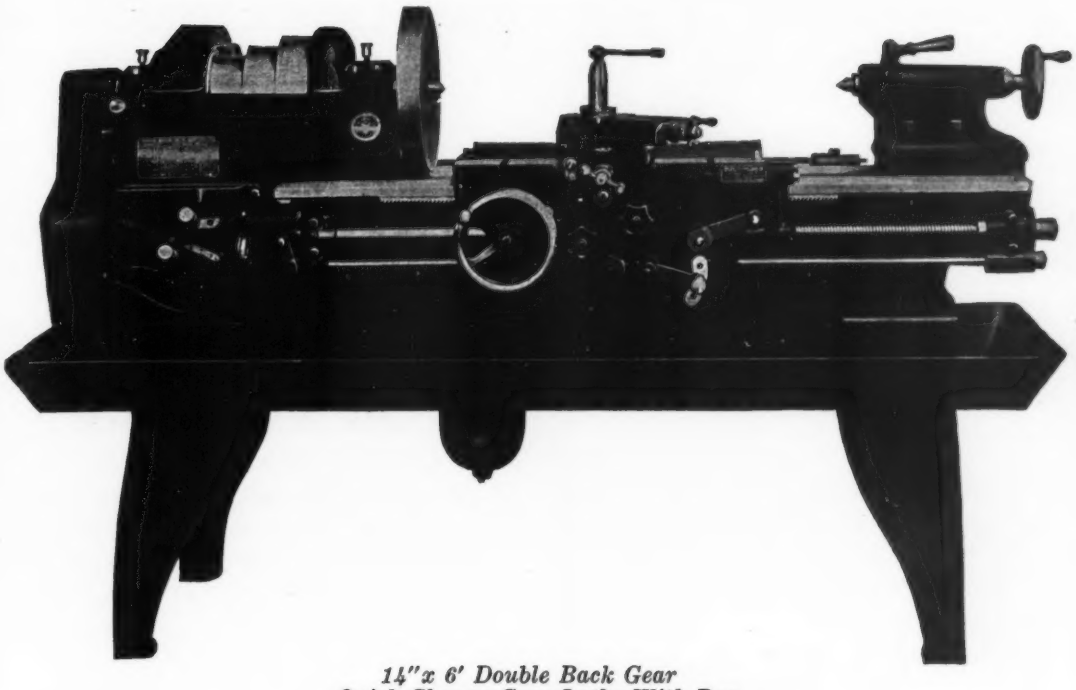
The American High Speed Ball Bearing Lathe substitutes "safe" for "sorry" in your school-shop. Its unmatched safety features work right with you in PREVENTING the dozen and one "I didn't think, etc.," accidents that mar the term's shop work. The motor, drive pulleys and belt are inclosed. All hand shifting is eliminated by a sure one handle belt control and shifting device. There is a quick-acting emergency brake on the head stock. Not only unusually SAFE but SURE. Any veteran shop foreman would delight in using it. Write us today for complete specifications.

The same safe and sure standards are found in AMERICAN saw benches, jointers, planers, band saws and woodworkers.

**American Saw Mill Machinery Company**
74 Main St. Hackettstown, N. J.

# AMERICAN

MANUAL TRAINING EQUIPMENT



*14"x 6' Double Back Gear*
*Quick Change Gear Lathe With Pan*

More Monarch Lathes are being used in manufacturing plants throughout the country than any other make. More Monarch Lathes are being installed in Manual Training Departments of schools than any other make of lathe. The student, upon completion of his school work, will find himself coming in contact with Monarch Lathes in most shops.

Monarch Lathes are built in sizes ranging from 9 inch to 30 inch swing, and bed lengths from 2½′ to 30′.

Our Engineering Department will gladly submit plans and layouts for machine shop installations and we are in position to give Vocational Instructors valuable information and plans, for which no charge is made.

There is a Monarch Dealer near you, who will gladly show you the merits of Monarch Lathes.

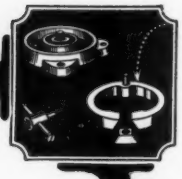
---

Let us send you Special Vocational Bulletin.

# THE MONARCH MACHINE TOOL CO.

304 OAK STREET SIDNEY, OHIO

***Largest builders of high grade engine lathes and specialist in lathes for Vocational Training.***



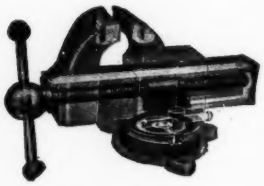
## A SWIVEL

that

**"Grips Like a Grizzly"**

***One of Seven Superior Parker Features***

Not a mere clamping device but a swivel base with the strength of a solid back jaw. Tightening up the wedge with the bolt expands the ring against the base with a grizzly-like grip the full circumference of the base.



*Send for Parker Feature Folder No. 11*

The Charles Parker Company

*Master Vise Makers*

Meriden, Conn., U. S. A.

# PARKER VISES

Grip Like a Grizzly

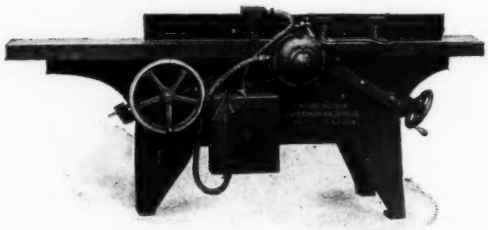
Established 1847

SMITH OF SMITHVILLE

Incorporated 1878

## Woodworking Machinery

**Improved No. 91-A**
**Hand Planer and Jointer**
**With Single Bevels to Each Table**



**Rear-side View of Motor-Driven Machine**

Showing Application of Motor Direct on Cutter-Spindle; also Adjustments to Guide and Front Table.

Address

## H. B. Smith Machine Co.

**Smithville, N. J., U. S. A.**

Or Nearest Branch

NEW YORK CHICAGO ATLANTA SAN FRANCISCO

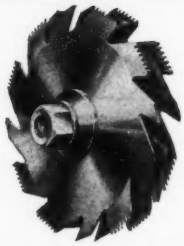
# V&B Braces

Do you have trouble with your end screw attachment? V & B Braces, with their patented key construction, make such troubles a thing of the past. A quality tool, of course!

## VAUGHAN & BUSHNELL MANUFACTURING COMPANY

*Makers of Fine Tools*

2114 Carroll Ave. ~ Chicago, Ill. U.S.A.



## YOU NEED A HUTHER DADO HEAD

***The saw that makes intricate cutting and grooving simple***

This saw, developed from our own patents, consists of two outside cutters and a sufficient quantity of inside ones to perform the required cut. The outside cutters can be used singly or in pairs as required.

Every builder or contractor, wishing lock corners or any sort of grooving, will find his production costs lowered by this saw.

*Write for complete information and prices, or send for one on approval. It may be returned at our expense if unsatisfactory.*

**HUTHER BROS. SAW MFG. CO.**

**Rochester, N. Y.**

OLIVER

# "Oliver" Electric Saw Bench

The "Oliver" No. 80 Precision or Variety Saw Bench is here illustrated with Motor-Arbor. This is a safe, efficient, compact and convenient arrangement which eliminates belts, belt guards, extra bearings; increases efficiency. Let us send you further data on this ball bearing saw; built also for belt drive.

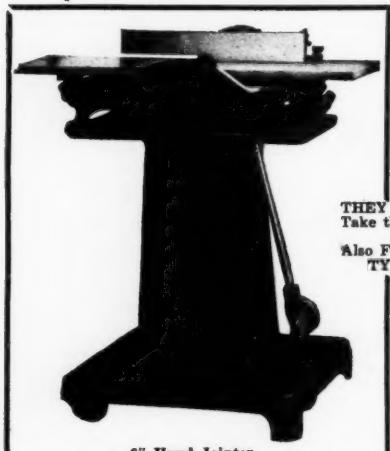
Oliver Woodworking Machinery is better—yet costs no more.

## Oliver Machinery Co., Grand Rapids, Mich., U. S. A.

**Branches: Chicago, Los Angeles, Minneapolis, New York, Portland, San Francisco, Seattle, St. Louis.**

**Agents—Oliver Machinery Co., Ltd., Manchester, England; Canadian Fairbanks Morse Co., Ltd., Canada; West India Machinery Supply Co., San Juan, Porto Rico.**

## UNION PORTABLE



6" Hand Jointer

6" Jointer
16" Band Saw
Universal Saw Bench
Plain Saw Bench
4" Jointer
Single Spindle Shaper
Comb. Universal Saw and 6" Jointer

THEY ARE ON WHEELS
Take the machine to the job

Also Furnished As BENCH TYPE MACHINES.

We recommend machines with the base which makes them conveniently portable.

All machines equipped with suitable motor with convenient switch to start or stop. Any lamp socket acts as your power supply line. Safety provisions have been taken care of to the absolute limit.

Send for Bulletin and Prices

**GALLMEYER & LIVINGSTON CO.**
SUCCESSORS TO UNION MACHINE CO.
388 Straight St., S. W.,
GRAND RAPIDS MICHIGAN, U. S. A.

Standard Carriage Clamp—Sizes 2½" to 12"

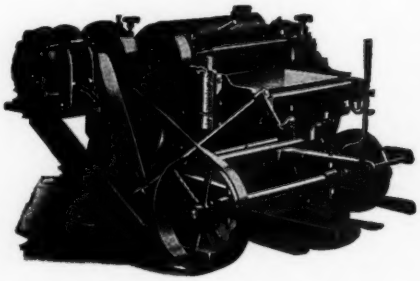
Perfection Steel Bar Clamp—Sizes 2' to 10'

Clamp Fixture for Wood Bar

We manufacture a complete and up-to-date line of Clamps, ranging in size from 1 in. to 10 ft. opening, also many other improved mechanics' tools which should interest you. Write for our new catalog.

Ask your dealer for HARGRAVE QUALITY TOOLS

**THE CINCINNATI TOOL CO.**
Established 1879 Waverley Ave. and C. L. & N. Ry.
Incorporated 1884 CINCINNATI, OHIO



**CRESCENT WOOD WORKING MACHINERY** in your wood working department will give the same satisfactory service that the machines are delivering in thousands of factories throughout the world.

Send today for catalog of band saws, saw tables, jointers, borers, disk grinders, planers, planers and matchers, swing saws, cut off tables, shapers, mortisers, variety wood workers, universal wood workers.

## The Crescent Machine Co.

25 Main Street
Leetonia, Ohio, U. S. A.

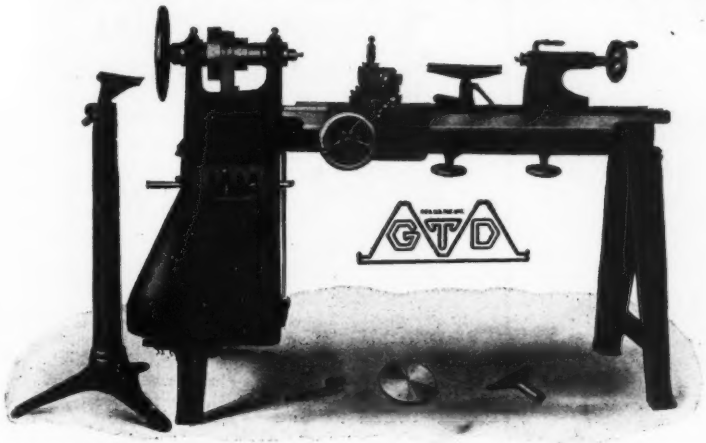
## "Cleveland" Grindstones and Sterling Abrasives

Training the country's youth to become useful men and women places upon school authorities an extraordinary responsibility—a responsibility that we feel as though we share to a certain extent through having supplied the schools so many grindstones.

Our efforts have now been broadened so that you can obtain artificial wheels as well as the natural ones from us. Our artificial wheels are sold under the name Sterling—a name that we make mean as much to you in its field as the name "Cleveland" has always meant in the natural stone field.

**The Cleveland Stone Co.**
1836 Euclid Ave. Cleveland, Ohio

# A Lathe that will "Stand The Gaff"




**No. 218 GTD Demonstration Lathe—for wood or steel.**

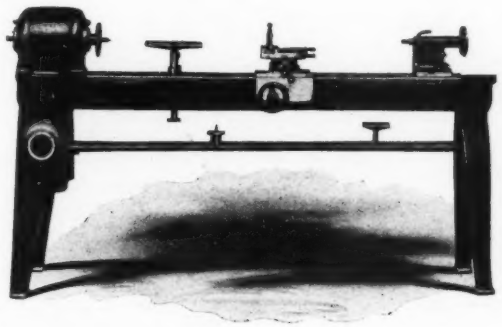
Here is a lathe that is designed especially for standing up and delivering the goods under extra hard treatment—designed that way because we know that inexperienced tentions, are hard on machines.
tions, are hard on machines.

They can't injure the GTD lathe. It's guaranteed to render service under the most exacting conditions. Moreover the prospective user has the option of several different models, so that the selection of one suited to his own particular needs should be very easy.

Our Machine Tool Department will be glad to help in any way possible.

*If you are in any way interested or responsible for the purchase of vocational equipment, or the greater success of vocational classes, write NOW for complete information on lathes.*

GREENFIELD TAP AND DIE CORPORATION
GREENFIELD, MASSACHUSETTS



## Motor Headstock Lathes

These are the highest development in Manual Training School Equipment. We build lathes of this type suitable for either direct or alternating current. Motors are ball bearing and have convenient speed regulating dials and snap switches. Convenient to operate and every provision made to guard against injury to operator or motor.

We build a complete line of Manual Training Equipment and have a special catalog which will be sent on request.

**HALL & BROWN WOOD WORKING MACHINE CO.**

**Broadway, Tyler, Ninth Streets,**

**ST. LOUIS, U. S. A.**

**No. 1-JG Grinder**

*Pivots to any desired angle. Dynamically balanced. Universal motor, operating equally well on A.C. or D.C. Speed, 15,000 r.p.m. Net weight, 8 lbs.*

**No. 1-BD Hand Drill**

*Length, 12½". Capacity—steel, ¼". Motor, dynamically balanced, operating on either A.C. or D.C. Complete with 10 ft. reinforced cord, plug, switch and No. 1-A Jacobs chuck. Net 6 lbs.*

**Made to Order for the School workshop**

THE more critical you are of grinder and drill performance the more you will be impressed with the unusual ability of the two sturdy tools shown here. Light and portable easy to handle, they can be quickly carried about from place to place—bringing the tool to the job instead of the job to the tool. Their exclusive dynamically balanced motors—swift, sure and smooth in their performance—gives these tools superior accuracy and enables them to withstand indefinitely the stress of uninterrupted usage. Their great strength and rigidity—their oversize construction of all vital parts, assure unfailing performance and long life.

Modestly priced for qualities so enduring and adaptable to a wide range of work, these two splendid tools will prove a valuable addition to any school workshop. If you are interested in widening the scope of your assignments—if you desire equipment which any student can handle with ease, we suggest you investigate our No. 1-JG Grinder and No. 1-BD Drill. Descriptive literature, prices, etc., upon request.

**Wisconsin Electric Co.**
**6462 Sixteenth St.**
**Racine, Wis.**

# DUMORE
## HIGH SPEED GRINDERS AND PORTABLE DRILLS

## Do You Sand Work Like This in Your School Shop?

This illustrates a portion of the many shapes which can be belt-sanded to advantage on the Mattison Hand Block Sander. Every woodworking establishment of any size operates at least one hand block sander.

Familiarize your students with belt sanding machine methods as they actually exist in the factories by having them use a Mattison hand-block sander for finishing large flat surfaces and moulded shapes, as well as small pieces and built up cases.

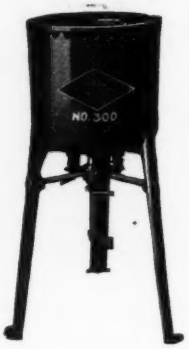
*Send for Bulletin No. 138-B showing dozens of interesting operations*

**MATTISON MACHINE WORKS**
Rockford, Illinois, U.S.A.

CHICAGO GREENSBORO, N. C. NEW YORK SAN FRANCISCO

## Speed—Economy—Durability

**JOHNSON No. 300 Melting Furnace**




The most efficient, durable and economical Melting Furnace made. It is as rapid as any air blast outfit and less trouble to operate.

**REQUIRES NO FORCED AIR BLAST**

Fitted with a cast iron removable Pot which has a capacity of 150 lbs. of metal.

Gas consumption only 40 cu. ft. per hour.

Height 28 inches.
Weight 100 lbs.

*Write for our complete descriptive catalog of Industrial Gas Appliances.*

**JOHNSON GAS APPLIANCE CO.**
Cedar Rapids IOWA

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**SHELDON WORK BENCHES**

will be of first importance in placing the industrial department of your school in the first rank. They have established a recognized standard for quality and design.

**E. H. SHELDON & CO.**
Muskegon, Michigan
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| Manual Training | Art | Mechanical Drawing |
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FOR

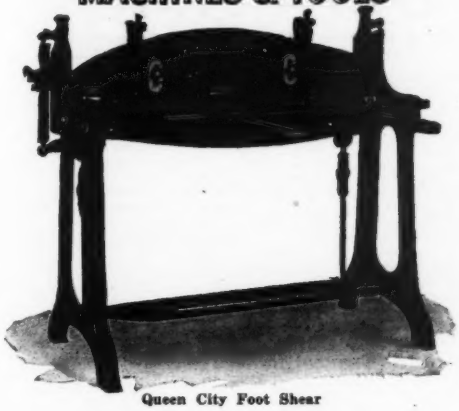
**MANUAL AND VOCATIONAL TRAINING**

For many years we have supplied high grade Tools and Benches to Schools, Colleges and Institutions, furnishing only the representative and guaranteed makes.

**Have you our 300 page Catalog of Tools, Hardware and Supplies? If not ask for Catalog No. 238.**

**HAMMACHER, SCHLEMMER & CO.**
NEW YORK Since 1848 4th Ave. and 13th St.

# SHEET METAL WORKING
## MACHINES & TOOLS



Queen City Foot Shear

### SHOP EQUIPMENT

Let us help you plan the layout of your sheet metal shop — give you the advantage of our engineering department's 44 years' experience on sheet metal working problems.

**Niagara Machine & Tool Works**
Established 1879
Buffalo, N. Y. U. S. A.

# NIAGARA
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# Overlook This

and you overlook one of the best courses for Manual Training Workshops

A large number of the foremost schools in the country (public and private) have come to realize this fact and are teaching ***Sheet Metal Working*** in their Manual Training Department. They realize sheet metal is rapidly taking the place of wood in most every industry and mechanics knowing this trade are in great demand.

The work is healthful, the hours short, and pay ranks high among the best paid trades.

The initial equipment required costs far less than any other equipment you could install considering the results obtained. The supplies necessary to carry on the course cost very little.

We will be glad to furnish an estimate on sufficient machines and tools to cover your needs upon receipt of number of pupils to be taught.

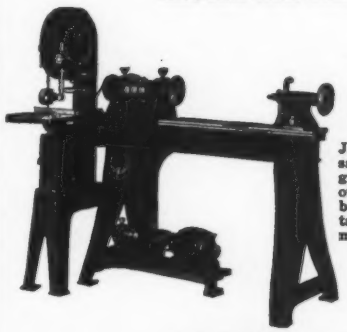
**At least send for literature on the subject.**

## BERGER BROS. CO.
"EVERYTHING FOR THE TRADE"

229-231-233-235-237 Arch Street,
PHILADELPHIA.

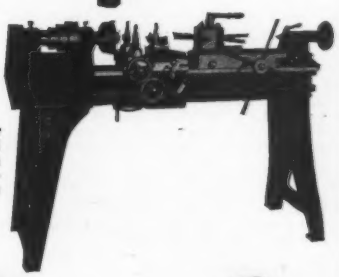
# LITTLE GIANT
## MANUAL TRAINING DEPARTMENT
## SPECIAL EQUIPMENT

Head Stock Motor Lathe



Combination Wood Lathe and Band Saw.

Jointer, planer, jig-saw, sander, buffer, grinder, mortiser and other equipment can be furnished and attached in a similar manner.

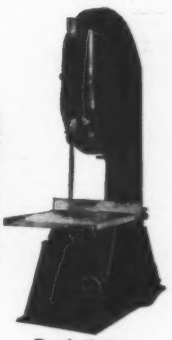


Metal Lathe— Motor or Belt Driven.

Miller, planer, gear cutter, grinder and other equipment can be furnished and attached the same as with wood lathe.

Power Hammer— Motor or Belt Driven.

All Little Giant Wood and Metal Working Equipment is sold on 30 days' trial, and guaranteed FOREVER against defective material and workmanship.



Band Saw— Motor or Belt Driven.

## LITTLE GIANT COMPANY
Established 1876

223 Rock St. Mankato, Minn., U .S. A.

# CLASSIFIED WANTS DEPARTMENT

**The rate for classified advertisements is $.07 per word per insertion, payable in advance. All wants subject to approval. Minimum 25 words. Forms close on 5th of the month preceding date of issue. Write for discount on yearly insertions.**

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**Goodrick Student Aprons**—size 29"x36"—brown, 60c; white, 50c. Instructor's apron gratis with first order of twelve or more. Shop coats, $4.90. Canvas Products Corporation, Fond du Lac, Wisconsin.

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**Basketry Materials**—We have everything for basket making, including reeds, willow, chair-cane, Indian splints, ash splints and wooden bases. Send Fifteen Cents for Samples, 65-page Catalogue and directions. This contains illustrations of over 500 baskets, trays, frames, etc., with suggestions as to making them. Louis Stoughton Drake, Inc., 33 Everett St., Allston, Boston 34, Mass.

**Everything for Elementary Handwork** — Also for basketry, weaving, bookbinding and chair caning. Mounting boards, Waldcraft dyes, crayons, burlap, scissors, punch and eye sets. Thomas Charles Co., 2249 Calumet Ave., Chicago.

**Basketry Material**—Reed, Raffia, Bases, Pine Needles, Ash Splints, etc. Free Basketry Catalogues. J. L. Hammett Company, Cambridge, Mass.

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**Cabinet Hardware and Upholstery Supplies for Manual Training.** Latest period and mission pulls, costumer hooks, wood knobs, tea wagon wheels, electric cluster posts, cedar chest fittings, mirrors, wood dowels, Seng bed equipment. Complete line Stanley tools. Send for catalog. Ohio Vocational Supply Co., Wapakoneta, Ohio.

**Special Service**—We make it a rule to give special service on Cabinet Hardware for teachers. Send a postal today for our catalog. F. A. Rauch & Co., 410 S. Market St., Chicago, Ill. In one line of business for 41 years.

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**Finest Quality**—We have cane, reed, webbing, flat rush, for all kinds of chair caning. Send Fifteen Cents for Samples, Directions and Catalogue. Louis Stoughton Drake, Inc., 33 Everett St., Allston, Boston 34, Mass.

### CATALOGUE.

**The most complete catalogue ever issued. Four hundred illustrations. Copy gratis. National Manual Training Supply Company, 322 South Fourth Street, Minneapolis, Minnesota.**

### CLOCKS

**Clock Movements**—chimes, dials, part of cases in the knock down, blue prints, designs, instructions, in fact, all assistance required by manual training teachers. Write for free booklet today. American Clock Company, Nicetown, Philadelphia, Pa.

### CUSHIONS

**We manufacture cushions in all types of filling and upholstery. Standard sizes or to your specifications. National Manual Training Supply Company, 322 S. 4th St., Minneapolis, Minn.**

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**Want Good Electrical Projects?** Build PEPCO Hot Pads or Toasters. Neat, simple, rugged, economical, satisfactory. We furnish instructions and parts. Service if desired. Address "PEPCO," Highland Park, Illinois.

### FORMULAS.

Formulas, Trade Secrets, Liquid Glue, Adhesives. You can make it yourself. Send $1.00. Address Florsayth Company, Chemical Cosmetics Formulists, Chemical Bldg., St. Louis, Mo.

### DRAFTING

**Catalog G.**—New illustrated catalog on Drawing Stands and Drafting Tables. Suitable for Schools, Drawing Classes, Artists, Draftsmen and Engineers. The Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass.

**The "CYMA" Compasses** are highly recommended by High School Drawing Instructors. They combine Lead, Pen, and Divider Points, all in one—no loose pieces—low price. Circular free. Sample sent for inspection. E. Bourquin, General Distributor—1353 Main St., Waltham, Mass.

### FIBRE CORD

See our full page advertisement regarding our complete Art-Fibre Weaving Service. Art-Fibre Cord, Stakes, Furniture Frames, Finishes, etc. Write for our catalog of designs. Grand Rapids Fibre Cord Company, Grand Rapids, Michigan.

### GLAZES

**Judson T. Webb,** formerly instructor in pottery at the Art Institute of Chicago, has located his laboratory and pottery supply business at 1710 W. 99th St., Chicago, Ill., Beverly Hills. He is prepared to furnish his glazes and colors, also clay, pottery tools and his potter's wheel. Send for new circulars. Judson T. Webb, 1710 W. 99th St., Chicago, Ill., Beverly Hills.

### LOOMS

**NEWCOMB Automatic, Fly-Shuttle, Hand Looms** for Educational, Vocational and Commercial Purposes. Write for Catalog—Newcomb Loom Co., 474 Taylor St., Davenport, Iowa.

### LEATHER

**Leather**—We have a fine line of leather and imitation leather ready for immediate shipment. Write us your wants today. F. A. Rauch & Co., 410 S. Market St., Chicago, Ill. In one line of business for 41 years.

**Leather for Bags, Cases, Pocketbooks, Fancy Leather Goods and Novelties.** Wilder & Company, 226-228 W. Lake St., Chicago.

### MODELING CLAYS

**Modelling Materials**—Plasticine, never hardens, Antiseptic, Ten Colors. Send for free sample. J. L. Hammett Company, Cambridge, Mass.

### PHONOGRAPHS

**Build Your Phonograph.** Quality phonoparts. Famous Serenado Motors. Quality Serenado motors and motors of other types. Electric Motors, tonearms, reproducers, amplifiers, case material, accessories. Free, blueprints and building instructions. Big saving. Wonderful results. Prompt delivery. Schools given special consideration and aid in phonograph construction. Catalog mailed for ten cents. Hoosier Manufacturing & Supply Co., 312 Baldwin Block, Indianapolis, Indiana.

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An opportunity to help you. Through the classified Want Columns you can obtain a position—change your present position — make known to thousands *that* special Service you want or can offer — the Special Machinery or supplies you want to buy or sell.

For quick results, write Classified Wants Department. Industrial-Arts Magazine, Milwaukee, Wis.

Build a genuine Choraleon Phonograph and save one-half. We furnish motors, tonearms, blue prints, instructions and parts. Send for catalogue and free blue prnit offer. Also full line Radio supplies, Radio cabinets. Veneer stock. Choraleon Phonograph & Radio Co., 923—20th St., Elkhart, Ind.

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**Free Samples**—We will send you free samples of all our reeds and raffia for school use. Catalog and directions, 15 cents. Louis Stoughton Drake, Inc., 33 Everett St., Allston, Boston 34, Mass.

**Reed, Raffia and Chair Cane**—Aviation quality, submarine prices. Reeds for kindergartens a specialty. Peter A. Wagner & Son, 1224-26 N. Marshall St., Philadelphia, Pa.

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We are cutters of stones interesting to jewelry workers. Assortments gladly sent on approval. Reasonable prices. George H. Marcher, 934 Santee St., Dept. A, Los Angeles, Calif.

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**We have a wide variety of Tapestries and Velours, in all sizes, styles and designs. It will be a pleasure to send samples. Write us your wants. F. A. Rauch & Co., 410 S. Market St., Chicago, Ill. In one line of business for 41 years.**

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**Wood Type, Metal Type, Printers' Supplies.** Mfd. by Empire Type Foundry, Delevan, N. Y. (Est. 29 Years.) Ask for Catalog 17.

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**Samples**—We will gladly send you Free Samples of our line of upholstering goods on receipt of inquiry. F. A. Rauch & Co., 410 S. Market St., Chicago, Ill. In one line of business for 41 years.

### WEAVING

**Weaving Supplies** — Looms, Roving, Jute, Warp, Macreme, Belfast Cord, etc. Free Weaving Catalogues. J. L. Hammett Company, Cambridge, Mass.

### WANTED

**Wanted**—Somewhere there is a man of originality and ingenuity whom we would like to employ in devising specialties and products made of paper and fibre board. We offer a splendid opportunity to such a man in our organization. The applicant should have some knowledge of mechanical equipment, be aggressive, and capable of taking entire charge of department. Address M-3, Industrial-Arts Magazine.

**Salesman**—Catholic, 30-35, to sell text books to Catholic schools, several positions open, territory Chicago and surrounding states. Permanent for the right man. Must have had some years college, or be a graduate of a teachers' training college or normal school, with teaching experience in the grades. Give full particulars regarding education, experience and references. Address M-6, Industrial-Arts Magazine, Milwaukee, Wis.

**Machine Shop Instructor** is open for position. Buffalo Normal School graduate, June, 1923, fully prepared to teach machine shop practice, related technical subjects, mechanical drawing and forge work. Nine years' practical experience. Good technical education. Seeks a position where ability can be used to advantage. Address M-4, Industrial-Arts Magazine, Milwaukee, Wis.

**Salesman**—Catholic, 30-35, to sell text books to Catholic schools, several positions open, territory east of Pittsburgh. Permanent for the right man. Must have had some years college, one with teaching experience preferred. Give full particulars regarding education, experience and references. Address M-5, Industrial-Arts Magazine, Milwaukee, Wisconsin.

Sixteen copies of July and October, 1922, issues of Industrial-Arts Magazine. Will pay 50c per copy. Must be in good condition. Address, Classified Wants Dept., Industrial-Arts Magazine, Milwaukee, Wis.

*We Announce Our 9th Annual Catalog*

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Mail your request now

AMONG OTHER ITEMS WE LIST:

Leathers and Imitations
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*A Complete Line of Cushions Made to Order*

*Write for our Catalog.*

**Thurston Manual Training Supply Co.**

*Jobbers and Manufacturers*

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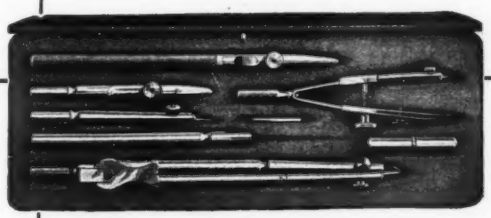
## COSMOS



ROUND system instruments are built for hard usage. Tubular construction eliminates all sharp edges and corners that tire then and, while firm joints hold the instrument in any set position without the slightest variance during a movement.

It is a pleasure to use them and to experience the ease with which they are manipulated. The low cost of Cosmos Instruments places them within the means of everyone, and they may be purchased at all good stationers and drawing supply stores. Write for Catalogue IA.

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**WEBER DRAWING MATERIALS**

***Everything for the Drawing Room.***

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It doesn't pay to try to learn a trade handicapped with inferior tools.

Start with a set of Starrett Tools and take care of them—they'll give you a lifetime's accurate service. And remember that the **best** tools are always cheapest — they reduce the chance of error and enable you to do more accurate work from the very start.

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*The World's Greatest Toolmakers*
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**STARRETT TOOL SETS**

No. 900

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**Starrett Tools**

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ELEMENTARY WOODWORK, CABINET MAKING, CARPENTRY, PATTERN MAKING, FARM WOODWORK.

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MANUAL TRAINING
**L - U - M - B - E - R**
We carry everything in our block of sheds, and can furnish anything you want. No order is too large or too small for us to fill.

***Maisey & Dion***
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**Alexander Brothers**
Belzoni, Mississippi
Band Mills:
BELZONI, MISS.
RED GUM, LA.
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Manufacturers of high grade pln. and qrtrd. Red Gum, White and Red Oak, Figured Delta Gum, Sap Gum, Soft-Texture Cypress, Cottonwood, Elm, Pecan, etc.
*Inquiries solicited. Samples per request.*

**CHERRY LUMBER CO.**
St. Bernard-Cincinnati, O.
Aristocratic
Walnut and Cherry
We can kiln dry, glue up, surface and sand. To make real furniture this is necessary. One piece or carload.

**VENEERED PANELS**
Black Walnut, Mahogany, Quartered Oak, Plain Oak, Birch, Yellow Pine. ¼" and ⅛" thick, all sizes.
*Send for price list.*
Western Veneered Panel Co.
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**Aromatic Tenn. Red Cedar Boards—Small shipments a specialty. Write us for prices, delivered at your railroad station.**
**BARTHMAN LUMBER CO.**
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**COMPLETE LUMBER SERVICE**
Consult us regarding your requirements
"A Dozen Boards Or A Dozen Carloads"
**JOHN SCHROEDER LUMBER CO.**
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One department devoted entirely to Manual Arts Lumber.
Intelligent Understanding of the Requirements of Each Customer.
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Immediate shipment of your order is but one feature of our service to you.
A large and varied assortment of Manual Arts lumber always on hand.


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**We invite all our readers to ask questions of any kind on any problem of Industrial Arts, and we promise to answer them fully and promptly. If we must, we shall investigate specially, charging the trouble and expense to our editorial appropriation.**

**If you are interested in the purchase of any of the items listed below, or if you want catalogs for your files, do not hesitate to check this list and mail it to the address given below:**

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Mirror Plates
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Molds
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Oil
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Tool Grinders
Tool Holders
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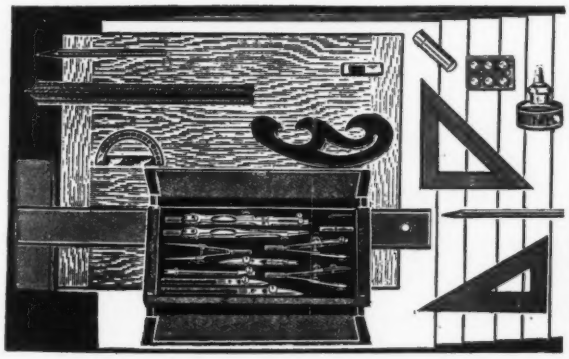

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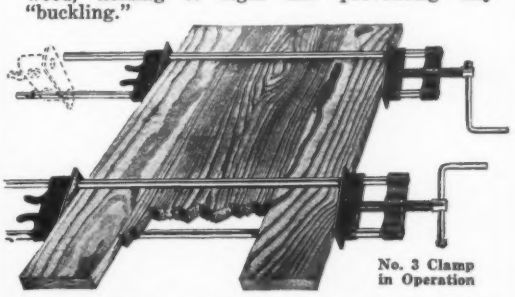

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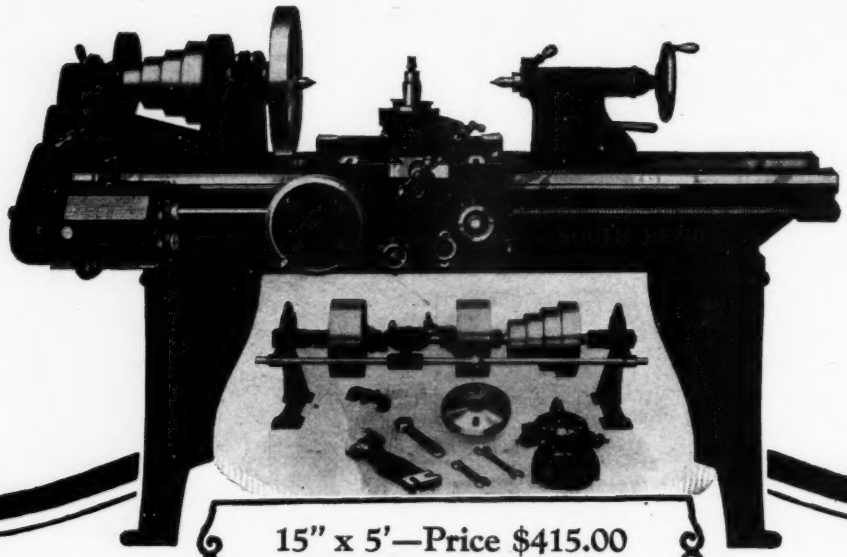

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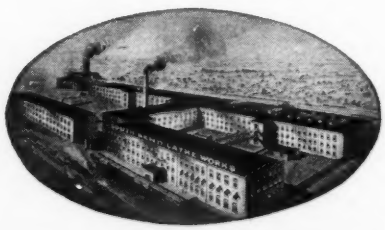

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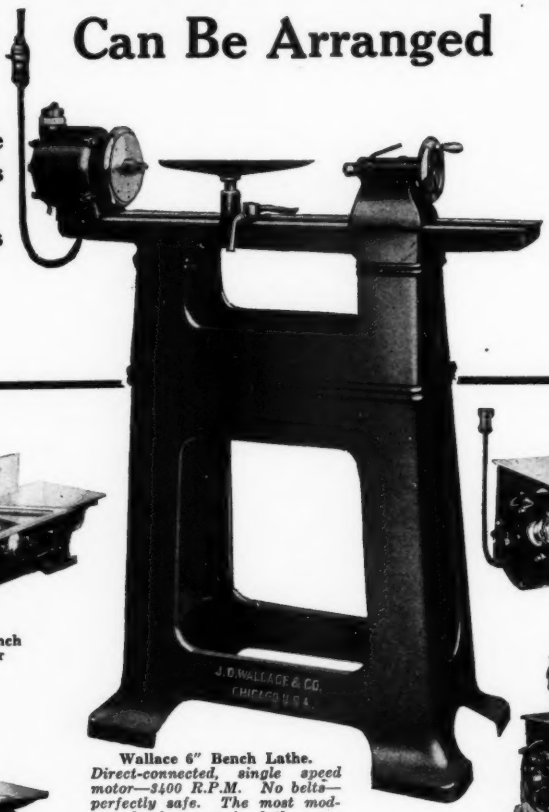


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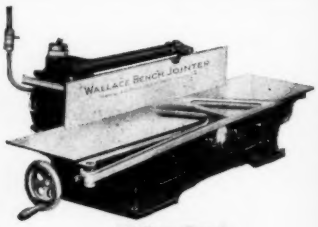


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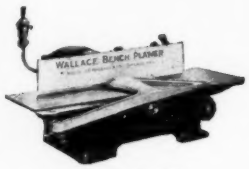


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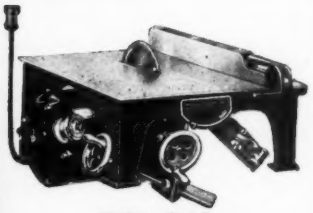

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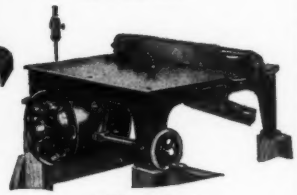

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INDUSTRIAL-ARTS MAGAZINE

Volume XII SEPTEMBER, 1923 No. 9

# Why Investigate and Analyze Local Occupations?

A. H. Edgerton, Teachers' College, New York City, Formerly
Supervisor of Vocational Information, Curricula, and Guidance, Detroit, Mich.

DESPITE occasional reports to the contrary, there is increasing evidence today that progressive school organizations are endeavoring to meet current and changing demands for purposeful instruction and systematic guidance. This statement refers to specialized, vocational activities as well as those experiences which are intended primarily for general educational values. In both connections, it is encouraging to note that marked increases in interest and in ambition, and likewise in school attendance, usually follow the inauguration or reorganization of courses of study which actually attempt to meet the needs and capacities of the learners in question, in preference to the inhuman practice of teaching certain subjects of instruction mainly because of their traditional justification. Then, too, the most democratic school systems have come to recognize the practical guidance value in providing adequate counsel, based upon reliable information, to assist individuals in *deliberately* and *intelligently* choosing both educational opportunities and life occupations.

In keeping with this practice, growing numbers of these schools are furnishing all secondary school pupils with accurate knowledge concerning the relative opportunities and requirements in various life callings. In general, this tendency is based upon the fact that present-day complexities resulting from the many changes in our social and economic development, demand that boys and girls no longer be required to base such important decisions and adjustments upon mere opinion or meager knowledge. Furthermore, it is believed that constructive criticism should continue to be directed toward all practices which force unreliable information and unwarranted decisions upon either children or adults.

**Greater Use of Information in Junior High Schools.**

One wholesome indication of this tendency is noted in the increased amount of directly and indirectly related information now being disseminated in the various practical-arts activities which are provided mainly as a means of general education. For example, in a recent study of 379 intermediate and junior high schools,[1] it was found that 86 schools (approximately 23 per cent of those investigated) now provide for a reasonable amount of so-called technical, vocational, and occupational information in connection with their industrial arts or manual arts activities. (See Table I.)

**TABLE I. THREE TYPES OF DIRECTLY AND INDIRECTLY RELATED INFORMATION ACQUIRED IN 86 SCHOOLS.**

| Kind. | Purpose. |
|---|---|
| Technical Information | For enlarging the understanding of tools, materials, operations, and principles directly related to shopwork. |
| Vocational Information | For illuminating the school experiences by giving insight into commercial processes and methods employed in economic production. |
| Occupational Information | For helping to appreciate and judge labor conditions, importance of work, health problems, future opportunities, remuneration, qualifications and training. |

In other words, these junior secondary schools are concerned mainly in aiding their pupils to develop ideas, perspective, and reasoning power, not alone by limited contact with representative materials, equipment, and methods but largely through the following closely related instructional provisions:

1. By broadening their understanding of economic production to increase respect for different workers and their respective occupational pursuits;

2. By preparing for greater insight and wisdom in judging and using products, services, and various resources;

3. By helping to develop general appreciation and intelligence in keeping with worthy citizenship;

4. By offering opportunity for testing interests and capacities as a basis for choice of suitable vocation, selection of training courses, and adjustment in actual employment.

Beginning in the seventh grade, the pupils in many cities of over 10,000 population are having short exploration periods in a number of unit courses involving interesting and profitable experiences, while they are continuing their studies in a score of subjects with other

[1] Present Status of Guidance Activities in Junior High Schools. Education, November, 1922.

## CHART I. SHOWING COMPOSITE ANALYSES OF SEVERAL UNRELATED OCCUPATIONAL PURSUITS AS TO

| VOCATIONAL INFORMATION | Occupation Selected from Investigation of Department Stores[1] | Occupation Selected from Investigation of Drafting Room[2] | Occupation Selected from Investigation of Toolmaking in Large Production Plants[3] |
|---|---|---|---|
| | **STOCK BOY OR GIRL** | **TRACER** | **DIE-MAKER** |
| **1. NATURE OF WORK** Occupational analysis | Assist in the care of merchandise in his or her department. See that merchandise is in order. Brings new merchandise from stockroom or takes merchandise to "bargain pit" or table. Keeps department in good appearance. Reports any merchandise not in perfect condition. Makes minor repairs. Acts as department messenger. Calls attention of buyer to incoming merchandise and assists in checking from invoice. Fill orders from department. Makes record of goods taken from or received in stockroom. Gives a correct account at any time of the merchandise of each kind in reserve and in the department. Calls attention of buyer to low or slow selling merchandise. Takes Lay Aways and H. F. A.'s to Lay Away department. Hangs stock. Watches customers. Runs errands. Folds and sizes blouses. | Traces penciled drawings in ink on transparent paper or cloth. | Making, blanking, and forming dies for adding machine, typewriter, and automobile parts. |
| **2. MAIN ADVANTAGES AND DISADVANTAGES** (a) Factors that interest and develop the worker | Possibility of promotion. Good opportunity to learn merchandise. In close touch with selling end, often helps sell. Clean work. Contact with different people. Variety of work. Attractive stock. | Advancing to position of detailer. | Variety of work offered; new problems to solve. |
| (b) Factors that cause physical or nervous strain | Physical strain from being on feet too much, and from hanging stock, especially the heavy lifting in the coat and fur departments. | Leaning over the board and continuous sitting position from day to day with eye strain tends toward nervousness. | If any not continuous. |
| (c) Factors that restrict mental growth | None. | None. | None. |
| (d) Factors that are in other respects important as affecting welfare of workers (i. e., liability to accident, occupational diseases.) | Basement, work not always satisfactory because of poor ventilation or dampness from washed air. Conditions good as they handle only new merchandise. | Eye trouble. | No general occupational disease or accident liability. |
| **3. QUALIFICATIONS AND TRAINING NEEDED** (a) General education | Intermediate | High school graduate preferred. | 8th grade, preferably high school. |
| (b) Necessary technical education | Store rules and regulations, policy and organization. Arranging, marking, and care of merchandise. Noting defects, taking inventory of stock, marking goods. Sales slips. | Known relation between mechanical drawing views. Familiarity with conventions and symbols. Ability to do accurate and rapid freehand lettering. | Read and interpret blueprints. Preparatory and advanced mathematics. Knowledge of general shop mechanics and materials. Names, care, and uses of common shop tools and machines. |
| (c) Manipulative skill | Handling merchandise with care. | Must be able to use skillfully all drawing materials and instruments with fair speed. | Operation of all standard machines and bench work to precision limits. |
| (d) Other requirements: Qualities essential such as accuracy, etc. | Accuracy, quickness, willingness to serve, orderliness, power of observation, initiative, good memory, penmanship, ambition. | Must be accurate, neat, quick, patient. Also must follow directions intelligently. | Accuracy, speed, application, adaptability; good eyesight, good health; ability to visualize, steady nerves. |
| **4. POSSIBILITIES IN REQUIREMENTS OF OCCUPATION** (a) Provisions made for systematic instruction of workers | Instruction is usually given by others in department. | Apprentice courses, lectures, work under guidance, standard practice sheets, trips. | None, except where there are apprenticeship or training departments. |
| (b) Necessary or technical knowledge | Knowledge of stock, kinds, qualities, prices, marking, etc., and inventory. Store procedure and regulations. Position of stock. | May become familiar with standard conventions used, dimensioning, notations, principles of drawing. | Application, best acquired in the plant by experience. |
| (c) Manipulative skill | Deftness in handling goods. | Greater skill in use of drawing instruments, improvement of quality and speed in technique. | Speed and accuracy in all specialized operations. |
| (d) Extent to which occupation can be learned in establishment | Entirely. | Can be learned entirely on the job. | In some plants entirely; others only partly. |
| (e) Line of promotion | Head stock boy or girl, marker, office position, head of stock room, salesperson, assistant buyer, buyer. | To detailer or lay-out man. | To executive depending on ability, experience, and training. |
| **5. REMUNERATION** (a) Wages | $7.00 to $15.00. | $0.25 to $0.75 an hour. | $0.75 to $1.50 per hour, depending on experience, training, and service. |
| (b) Special | 10% to 20% discount on all purchases in store. | | Stock certificates; anniversary checks; group insurance; apprenticeship bonus. |
| **6. HOURS OF WORK** | About 8 hours. | 8 to 9 hours a day or 44 to 49 hours a week. | 8 to 9 hours a day; 40 to 50 hours a week. |
| **7. SEASONAL DEMANDS IN WORK** (a) Busy season | Between Thanksgiving and Christmas, April to June, and special sales. | Practically none except in automobile industry and in building operations. | Dependent upon general manufacturing conditions throughout country. |
| (b) Slack season | February, July, and August. | None. | Same. |
| (c) Fluctuation in employment | Constant for most. Stock help always needed. | None. | Employment usually steady. |

[1] Margaret Boland, Flora Anderson, Alice Gordon, and Grace Jones conducted this investigation.
[2] Frank R. Kepler, Roy E. Sprague, and Ernest R. Hoppe conducted this investigation.
[3] George H. Snadden and James P. McGuinness conducted this investigation.

## NATURE OF WORK, MAIN ADVANTAGES AND DISADVANTAGES, QUALIFICATIONS AND TRAINING NEEDED.

| Occupation Selected from Investigation of Sheet Metal Trades[5] | Occupation Selected from Investigation of Commercial Art[6] | Occupation Selected from Investigation of Power Machine Operators in Textile Industry[7] | Occupation Selected from Investigation of Industrial Chemistry[8] |
|---|---|---|---|
| **JOURNEYMAN** | **CARTOONIST** | **GARMENTS (DRESSES)** | **ROUTINE WORKER** |
| Inside worker is employed in the manufacture of the products. Outside worker is employed in the erection and repair of jobs. The nature of work is as follows: laying out jobs from prints, cutting metal into shape, forming up jobs, riveting, soldering, seaming, and assembling. | Drawing cartoons and comics. | 1. Operating single needle machines; stitching of single short seams, stiching of single long seams, joining of garments, finishing neck and sleeves.<br>2. Operating double needle machines; placing sleeves in waist, finishing neck and sleeves, placing ruffling in collar and cuffs.<br>3. Operating piquot or double hemstitching machines.<br>4. Operating ruffler on single needle machines.<br>5. Operating embroidery machines. | Do the control work. The work depends upon the plant. In automobile factories, they test steel, brass, bronze, enamel, coal, oils, etc. Usually each man makes the same tests day after day. For example one man on steels runs carbon another manganese, another sulphur, and a fourth phosphorus. This applies particularly to a large factory like Ford's. In the smaller factories, the same man makes several or all of these tests. In a rubber factory like Morgan and Wright, the work would be very different. Organic and physical chemistry would be applied. The substances tested would be rubber, cement, gums, acetone, benzole, alcohol, ether, and other organic solvents. |
| Work started and completed by one person. Work varies, chance of advancing to estimator. | Opportunity to use imagination and initiative. Creative nature of work. Variety of material. Admiration coming from general public for work produced. Constant touch with wide field of thought and current events. | Machine work and money received. Variety of materials and garments. | Conditions and materials are occasionally changing. Thinking through the chemical actions involved whenever difficulties are met will add interest and develop the worker. |
| Noise of working metal, working in crowded quarters on erection jobs, working off the ground, lifting. | Confining nature of work calls for distinct change of atmosphere with some physical exertion after working hours. Eyes must be well cared for. | Concentration and eye strain. | No physical strain. Repetition of tests becomes monotonous. |
| None. | Easy for successful artist to fall behind. Usually does not read enough. Continual sitting posture. | None. | Repetition makes the work become mechanical. Depends upon the man. |
| Falling from heights, cuts, and acid burns. | Use of eyes. Speed with which some drawings must be excuted. | Light airy room. Machines well guarded. | Accident insurance companies rank chemists second as risks. Explosions occur, some gases are poisonous. |
| Intermediate. | Education should be cultural, including history, literature, and the arts. | Intermediate and high school. | Tenth grade and up. Few eighth graders work up. |
| Knowledge of metals and their uses, tools and supplies. Mechanical drawing, mensuration, etc. | Should have enough technical education to understand fundamental principles underlying mechanics. Should know how zinc and copper etchings are made. | Knowledge of materials and garments. | Qualitative and quantitative analysis usually essential. Some require organic. |
| Operating machines, forming metals, laying out jobs, etc. | Skill in art class or private school. Should include life drawing drapery drawing and pen and ink work. | Ability to handle light materials and stitch without basting, etc. | Skill in the use of balances, burettes, pipettes, thermometers, and other special apparatus is essential. |
| Accuracy, speed, interest. | A newspaper cartoonist is an editorial writer. Sometimes he contributes the idea, sometimes he brings out someone else's idea. | Good, steady girl. Accuracy, speed, adaptability. | Accuracy, attention to details, promptness, speed, honesty, dependability. |
| Six months course given at Cass Technical School in sheet metal bench work under the supervision of the Sheet Metal Constractors' Association.<br>Knowledge of operations with machine and hand tools, metal gauges, wire gauges, strength of materials, ability to figure out new jobs.<br>Skill in working up metals, handling machines and hand tools, etc. | Practically no apprenticeship opportunities with the modern newspaper; editorial cartoons cheap and larger newspapers have trained men only.<br>Technical knowledge of the work is continuously gained by the cartoonist. New practical problems are always confronting him.<br>Skill is constantly acquired. | Special school in rush seasons. At other times only instruction in English.<br>How to run power machine and handle materials.<br>Stitch without basting. | Some factories give a short school course to college graduates in the special methods employed in their plants.<br>In special cases green men have been taught to do routine work, but in the great majority of cases experienced chemists are required.<br>Some factories train helpers or messenger boys for routine work. |
| Entirely with proper instruction. | Modern newspapers offer little opportunity for boy or girl to learn. | All, except some machine operations. | Usually experienced men are required. |
| To layout man or foreman. | Promotion depends entirely upon the individual. The variable factors are talents, love of the art, training and experience. | Increase in output. Single thread and needle to double and speed machine. | May advance to special or research work if college graduates, seldom without. Greatest opportunity is chance for promotion to other departments in the factory. |
| $0.60 to $1.00 an hour. | The average good cartoonist should make from six to ten thousand. | $10 to $12 a week while learning. $15 a week and up regularly. | $80 to $150 a month. Some start at $5.00 and work up to $8.00 or $10.00. |
| Time and one-half for overtime. | Wage depends upon the newspaper. | $25 and up for special work. | |
| 50 hours a week. | Usual business hours. | 7:45 to 4:30. | Eight or nine hours. |
| Spring and fall. | No fluctuation in demand. | September, January, June. | All year. |
| November, December, January.<br>Very little. | None.<br>None. | Summer.<br>Yes, in rush seasons the number is doubled. | None.<br>Very little. |

[5]James R. Hendrickson conducted this investigation.
[6]Alex Crockett conducted this investigation.
[7]Julia P. Grant and Alice Van Dyke conducted this investigation.
[8]Sherman R. Wilson conducted this investigation.

## CHART II. SHOWING CONTINUED ANALYSES OF EACH POSITION AS TO POSSIBLITIES IN REQUIRE

**Continued from Chart I which lists (1) Nature of Work; (2) Main**

| VOCATIONAL INFORMATION | Occupation Selected from Investigation of Department Stores[1] | Occupation Selected from Investigation of Drafting Room[3] | Occupation Selected from Investigation of Toolmaking in Large Production Plants[4] |
|---|---|---|---|
| | **STOCK BOY OR GIRL** | **TRACER** | **DIE-MAKER** |
| **8. ARE WORKERS ORGANIZED?** | No. | No. | No. |
| **9. ENTRANCE AGE** | 17 years (15 or 16 years with permit.) | 16 to 18 years. | 16 to 18 years of age. |
| **10. TIME REQUIRED TO LEARN DUTIES** | 2 or 3 months depending on stock handled. | Three to six months. | 4 years or more. |
| **11. IS SUPPLY OF LABOR ADEQUATE TO MEET DEMAND?** | Yes. | Yes. | Yes, at present. |
| **12. IS DEMAND FOR LABOR INCREASING OR DECREASING?** | Increasing. | At present time increasing. | Increasing at present. |
| **13. WHAT IS THE SOURCE OF SUPPLY?** | Boys and girls leaving school. Promotions from cashier-inspectors. | Office boys, blue print boys, secondary and continuation schools, advertisements, employment bureaus. | Graduate apprentices; other shops; promotions. |
| **14. COMMON DEFICIENCIES OF WORKERS** | Lack of interest in work; failure to appreciate opportunities; inaccuracy in matching merchandise. | Failure to make neat drawings, poor letterers, lack of technique, inattention to details. | Lack of mechanical ability; no originality; no native ability; dissatisfaction; too slow; lack of appreciation of the value of accuracy; lack of interest. |

[1]Margaret Boland, Flora Anderson, Alice Gordon, and Grace Jones conducted this investigation.
[3]Frank R. Kepler, Roy E. Sprague, and Ernest R. Hoppe conducted this investigation.
[4]George H. Snadden and James P. McGuinness conducted this investigation.

differentiated groups of pupils. This plan, including reliable information and systematic counsel, frequently gives pupils, counselors, and teachers some sane basis for the future adjustment of courses and the selection of suitable life work. When this parallel study of occupations is based upon factual material, rather than upon assumptions and guesses which naturally are variable, pupils are better enabled to enter their life careers with some vision of the vocational opportunities and employment requirements that constitute an intelligent choice. Experience in several schools already has demonstrated that this procedure can prove an incentive for causing pupils to continue through the ninth grade and to enter the senior high school, in which case they are prepared to choose courses more intelligently and to make progress from the outset.

**New Emphasis in Senior High Schools.**

Those who have participated in the slow but certain reorganization of these activities for general educational purposes, aside from certain limited values in wage-earning preparation, are well aware that these new developments in the seventh, eighth, and ninth grades gradually are forcing the discontinuance of similar objectives and activities on the high school level throughout the United States, where accepted junior high schools exist. In answer to this challenge, several senior high schools have arranged a specific plan of part-time coöperation for those who expect to enter industrial callings rather than colleges. In most cases these schools wisely place the emphasis mainly upon the mathematics, drawing, and science required, rather than upon additional so-called shopwork. The coöperative plan preferably provides a well organized and supervised sequence of shopwork in a productive plant and also the coördination of shopwork and supplementary school work of a related and vital nature.

It is believed (there is but little proof as yet) that this purposeful education and training in the principles of applied science, mathematics, and drawing will provide for more rapid advancement and higher grades of work in the occupations chosen. In a few cases, these studies also include industrial organization problems concerning efficiency of management and the coördination of the various factors in industry from the standpoint of building and equipment, purchase of materials, and employment and supervision of workers through all phases of production to the final assembling and distribution of products.

With the vocational emphasis in the senior high school, which naturally is expected to follow the "self-finding" emphasis in the junior high school organization, certain related knowledge is considered either necessary or desirable as supplementary training in industrial intelligence for those secondary school pupils:

A. Who seek understanding of and insight into local industries as a basis for future promotion in industrial and allied callings;

B. Who desire industrial perspective as a part of their training for leadership in business and industrial pursuits;

C. Who wish an overview of the industries to better equip themselves for professional or semi-professional careers.

In making worth while courses of study for these secondary school pupils it is obvious that those concerned will need to consider the necessity or desirability of acquiring such appropriate knowledge as the following:

**1. How fundamental principles in mechanics affecting levers, gears, belted pulleys, etc., are directly applicable to: (a) kinds of tools and machines used in the vocation; (b) kinds and qualities of materials used for different purposes.**

MENTS OF OCCUPATION, REMUNERATION, HOURS OF WORK, SEASONAL DEMANDS, AND THE LIKE.

Advantages and Disadvantages; (3) Qualifications and Training Needed.

| Occupation Selected from Investigation of Sheet Metal Trades[5] | Occupation Selected from Investigation of Commercial Art[6] | Occupation Selected from Investigation of Power Machine Operators in Textile Industry[7] | Occupation Selected from Investigation of Industrial Chemistry[8] |
|---|---|---|---|
| JOURNEYMAN | CARTOONIST | GARMENTS (DRESSES) | ROUTINE WORKER |
| About 10%. | No. | No. | No. |
| Determined by age as apprentice or helper (preferably 20 years or over). | About 21, depending on individual. | 16 years and up at entrance. 30 and up for average worker. | 18 to 45. |
| 3 to 4 years and up. | From two to six years, depending on individual. | 2 or 3 months. | One to four years. Single operations may be learned in six months or less. |
| No. | There is only one newspaper cartoonist employed in Detroit. There is always demand for a first-class man. | No, not of skilled workers. | Yes. |
| Increasing. | Will probably increase. | Increasing. | Increasing slightly. |
| Helpers and floaters. | Art schools and commercial art studios. | Advertising usually. | High school graduates, technical schools, and colleges. |
| Loitering on job, tardiness, lack of eighth grade education, few are not all-round tradesmen, floaters. | Lack of versatility. Young workers are apt to overestimate ability. Ability acquired if worker has persistence. Practical imagination is essential. | Illiteracy. Lack of speed in manipulating materials. | Carelessness, irresponsibility. Habits of being late to work and in handing in reports. Lack of training. Failure to appreciate importance of detail. |

[5]James R. Hendrickson conducted this investigation.
[6]Alex Crockett conducted this investigation.
[7]Julia P. Grant and Alice Van Dyke conducted this investigation.
[8]Sherman R. Wilson conducted this investigation.

2. How the common and special hand and machine tools are: (a) operated (principles involved); (b) constructed (operations executed).

3. How iron, lead, wood, rubber, textiles, oil, paper, and other materials are: (a) effected by different processes in their manufacture; (b) controlled by their main properties and characteristics.

4. What it means to participate in typical units of productive work which stress: (a) general spirit of modern shop or office; (b) time element demanded by methods of particular occupational pursuit; (c) accuracy required by work specifications and facilities.

5. How to do simple construction and repair work in order: (a) to meet a possible emergency (office or plant); (b) to effectively instruct workers (new and old); (c) to properly supervise work (production, organization, maintenance); (d) to judge the worth of the job (approximate cost and suitable results).

6. What the conditions, requirements, and possibilities actually are in these callings or vocations with special reference to: (a) nature of occupations; (b) remuneration; (c) natural qualifications; (d) preparation.

**Notable Improvements in Vocational Courses.**

In specific vocational courses, the more or less clear-cut needs of those who are desirous of preparing themselves for direct entrance into definite occupational pursuits, or are continuing their supplementary training, have resulted in notable improvements in the following closely related instructional provisions, especially where analysis and investigation have received due attention.

1. Increased emphasis upon determining well defined needs and objectives for offering the various units in question;

2. Practical analysis for selecting the particular skills and knowledge which might well be acquired in order to meet these needs and objectives;

3. Greater interest in evaluating these teachable elements for the purpose of weighing values as to the general order and time when each unit might be most effectively taught;

4. More care in planning each unit in terms of the specific needs and standards for the class, group, and individual, and in relation to the other units of instruction;

5. Better procedure for choosing the most suitable methods and devices for presenting the selected units in keeping with the above considerations;

6. Improved attitude toward checking up and testing the different trainees to ascertain how fully the instruction has suceeded in realizing the subjective and objective standards.

With comparatively few exceptions, those directly responsible for this specialized instruction have been agreed for some time that their respective trainees must be aided in acquiring a sufficient degree of manipulative skill and related knowledge to increase their technical efficiency. Perhaps to a somewhat less degree, it is being realized, more and more, that the resulting powers in skills, attitudes, and appreciations are acquired most advantageously when opportunity is provided for participation in appropriate thought-provoking situations which give due consideration to desirable initiative and self-adjustment in the trainees' chosen vocations.

**Collecting and Evaluating Vocational Information.**

In his famous lecture on "Acres of Diamonds," Russell H. Conwell, of Philadelphia, has told us an interesting story of a Persian who sold his little farm in order to secure funds to finance a diamond hunting expedition. In brief, it seems that the purchaser discovered an inexhaustible diamond mine on this small farm which he had purchased, while its former owner roamed the world and failed to find even a single jewel. It is a readable story with an obvious moral which I am inclined to believe is somewhat applicable to this problem of securing suitable vocational information for our different purposes. It often happens that the factual material which we need most is right at hand; and

frequently the experience of collecting and evaluating our own data, in coöperation with others directly concerned, proves of sufficient value to compensate us for the time and energy involved, even though the information desired is available from other sources.

The principal industrial, commercial, and professional occupations in Detroit are being surveyed continuously in order to secure valuable information pertaining to the nature of the work, the main advantages and disadvantages, the qualifications and training, the possibilities and requirements, the remuneration, and the like. These studies have been undertaken by those seeking training for some form of school counseling, or similar educational work, and were developed in each case by those having previous experience or familiarity with the particular fields in question. All persons directly or indirectly interested are indebted to the many representatives of the various establishments in the city, who have so generously aided the schools in securing these useful sources of reliable information by their generous coöperation with the different men in charge of the Vocational Counseling courses which have been conducted during the past two years through a coöperative arrangement between the Vocational Education Department of the University of Michigan and the Detroit Public Schools.

Results of these completed occupational investigations and analyses are evaluated and arranged in the particular form shown in Charts I and II in order that adequate facts relative to the possibilities and demands in the different vocations may be made easily available for school use. It will be observed that these composite statements have been prepared for convenient use in intermediate schools, continuation schools, high schools, and special classes, as a part of the whole program for providing systematic educational direction and vocational guidance. The information in question has been carefully collected and checked by those school counselors, house principals, and teachers whose names appear in connection with each typical unit selected for Charts I and II. Comparatively little expense has been incurred in these surveys excepting for such special assistance and supervision as was needed from the central office.

In publishing these occupational surveys[2] the Board of Education is continuing its policy of supplementing the training and experience of all school representatives who have been assigned the specific responsibility of systematically assisting pupils either in choosing possible educational advantages or in acquiring adequate occupational knowledge, or in both. These and other reliable findings, which might be used as helpful sources of information, are made available for reference purposes, in order to aid school counselors, advisors, and teachers in providing adequate counsel, instruction, and guidance for all boys and girls in their respective school organizations.

(Concluded in October)

[2]This series of bulletins on **Opportunities and Requirements in Local Occupations** is available in three parts at present: Part I includes department stores, chain grocery stores, commercial art, drafting rooms, toolmaking in large production plants, sheet metal trades, industrial chemistry, power machine operators in textile industry, special salesmanship (automobiles, bonds, stocks, insurance); Part II includes carpentry trades, printing and publishing, nursing, social service, stationary engineering, structural engineering, candy making, cigar making; Part III includes clerical positions, telephone operation, baking industries, wholesale drug industries, auto mechanics, selected building trades, laundry work, photography, dentistry.

# Britannia Metal-II

**Professor William H. Varnum, University of Wisconsin.**

**Pewter and the Revival of Its Use.**

IN the July issue of the INDUSTRIAL ARTS MAGAZINE we found Britannia, a harder and more durable metal, replacing pewter. The strong Pewterers' Guild of London, founded in 1348, counted in 1902 but two members, while its secret processes and ancient Guild Hall had passed into history.

But the cycles of history prove that traditions and customs revive. As an illustration of this we have but to study the development of Britannia. Incorporating in 1824, the firm of Reed and Barton started the manufacture of Britannia in Taunton, Massachusetts. The invention of electroplating turned the style and popular taste toward plated ware and the fine color of Britannia became obscured by a coating of silver plate.

With the increasing prosperity of the country the firm began to manufacture solid silverware. The recent increased cost of living naturally was reflected in sales of the silver products of the company and with the present period came a demand for less expensive ware. As a result of this movement we find the firm of Reed and Barton after an existence of one hundred years, repeating the original patterns of the first venture in the original material—Britannia.

During the last century, sporadic attempts to revive pewter have led to failure mainly because the simplicity and beauty inherent in the old designs had been disregarded. Over-decoration of the surface of a meat platter with an under-decorated female figure comes to my mind as a typical example of one revival, a form of enrichment which would have caused an unprecedented upheaval in the Pewterers' Guild.

Britannia is appearing in the salesrooms of the various Craft Societies of the country, and art magazines are devoting considerable attention to ancient products. The current attempt at revival seems genuine, inasmuch as the old ideals are evidently considered in the designs. The time seems opportune for the introduction of Britannia into art-metal classroom practice.

Medieval technical methods of working pewter are essentially the same today. Casting, spinning and

hammering or raising these metals represent typical modern practice. Formerly pewter and Britannia were cast in highly finished brass piece moulds put together with great accuracy. The Pewterers' Guilds owned large numbers of these moulds which were rented to the craftsmen for quantity production.

In the Renaissance, less expensive sand moulds were introduced for limited production, but the cost of removing the finely granulated surface from the ware added a large amount to the labor of finishing the pieces.

Modern methods show the use of highly finished iron moulds. For school use moulds of plaster-of-paris are entirely satisfactory for such appendages as handles, knobs, spouts, bases, paper weights and other similar solid or semi-solid objects. Castings may be made of any thinness and come from the moulds with a finish in direct proportion to the smoothness of the moulds.

DUTCH AND ENGLISH PEWTER OF THE 17th, 18th, and 19th CENTURIES.
(In the Collection of the Metropolitan Museum of Art, New York.)

Spinning Britannia on a lathe is possibly the process most frequently used by the modern manufacturer of hollow ware, with the products appearing later on as silver plated ware for table use. In spinning, a block of wood is turned to the desired shape. A circular disc of metal is placed against this form by the use of a chuck, and all parts are again mounted on the lathe. By the use of a blunt tool, the rotating metal is spun or wrapped around the turned form into the shape desired.

Other products raised by the use of wood or metal stakes and hammers possess more individuality and quality than are found in either the cast or spun forms of quantity production.

**The Material.**

Britannia may be purchased in sheets. Under 20 gauge, B & S, the sheets are rolled 18 inches wide; in thinner gauges one may secure sheets 30 to 36 inches in width. There are three qualities of the metal: number one; number two and two-ply. No. 1 is an alloy of 90.7 per cent tin; 7.8 per cent antimony and 1.5 per cent copper and is best for hammered projects with a minimum amount of raising. No. 2 has 92 per cent tin, 5 per cent antimony and 3 per cent copper; is of a softer grade which spins and hammers much more readily. Two-ply is a lower priced alloy. The facing is of No. 1 metal with a backing of lead, tin and antimony.

The present market price of No. 1 Britannia is 57 cents a pound for 25 pound lots, with a material reduction for larger quantities. The Hoyt Metal Company, Boatman's Bank Building, St. Louis, Mo., is by far the largest manufacturer of the metal, has quoted the lowest prices and will cut the sheets to order without additional expense. Silverware manufacturers retail Britannia in 25 pound lots at one dollar a pound.

The absence of lead in grades one and two makes the metal non-toxic and thus superior to pewter. Tin, the chief member of the alloy has important qualities. Its whiteness and freedom from oxidation, lend to decoration a softness and delicacy of treatment which has been overlooked, mainly because of its industrial value.

Britannia may be soldered by using strips cut from the material itself or by a solder composed of 50 per cent tin and 50 per cent lead, which is preferable for school use. The melting point of Britannia is between 425 and 440 F., hence it will stand boiling water, but of course one should not place the ware on a stove or other hot surface.

**The Tools.**

The usual copper working equipment will do equally well for Britannia, but care should be taken to keep all stakes and hammers free from scratches and other marks: the softness of the material makes it susceptible to marks upon forming surfaces. Relatively coarse files should be used for rough filing, and single-cut smooth files for finishing cuts. As the metal has a tendency to clog the files, one should be provided with file cleaners. Small raw-hide and wooden mallets are indispensable, while the pointed horn hammer is useful.

For heat, a small gas-and-air blow-pipe, or even a mouth blow-pipe, will answer. As I indicated in my previous article, the ease with which the material may be manipulated is one of its most valuable assets but all equipment must be maintained in excellent working condition, or valuable time will be consumed in repairing damage caused by their defects.

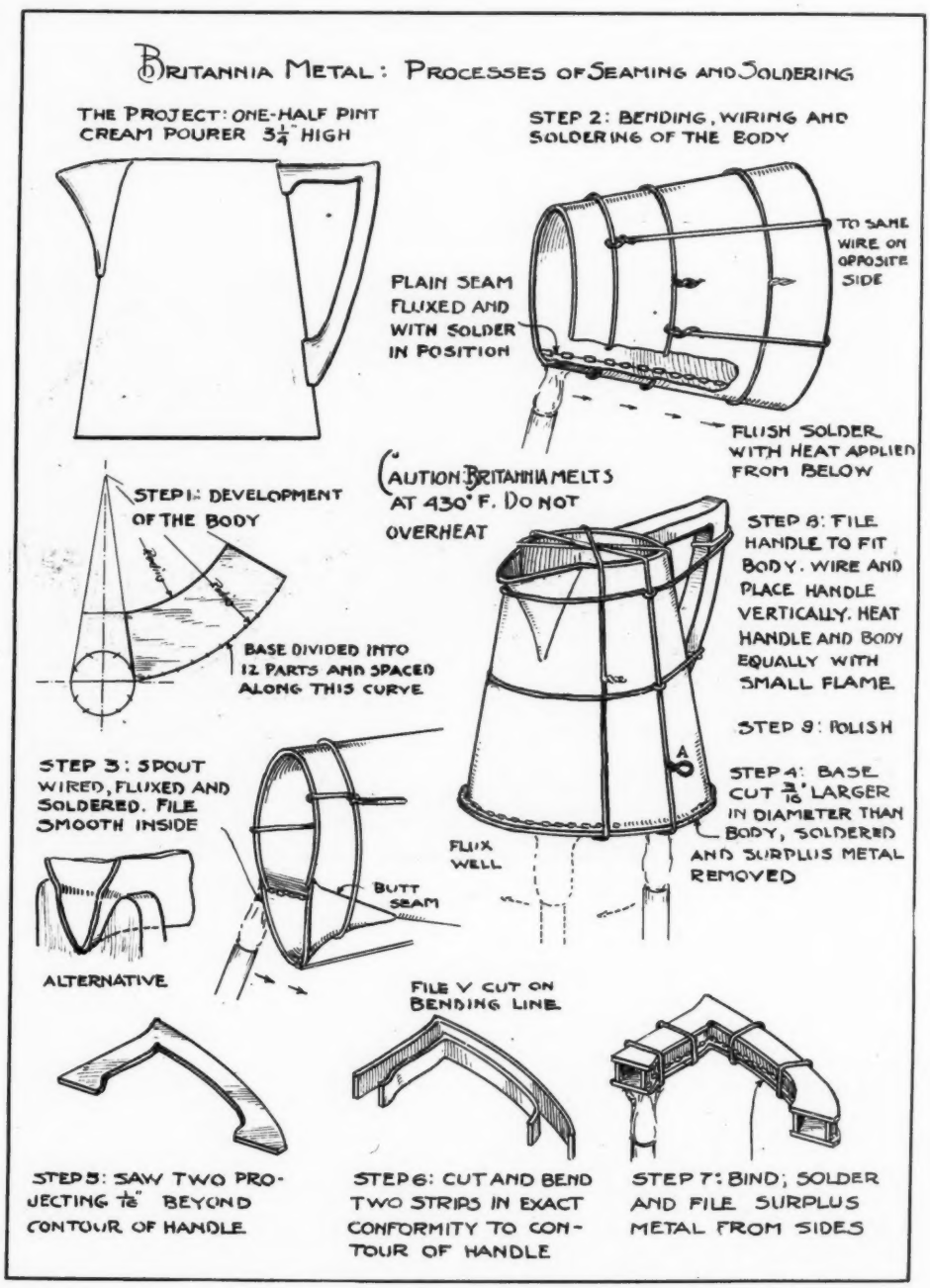

BRITANNIA METAL: PROCESSES OF SEAMING AND SOLDERING
THE PROJECT: ONE-HALF PINT CREAM POURER 3¼" HIGH
STEP 2: BENDING, WIRING AND SOLDERING OF THE BODY
TO SAME WIRE ON OPPOSITE SIDE
PLAIN SEAM FLUXED AND WITH SOLDER IN POSITION
FLUSH SOLDER WITH HEAT APPLIED FROM BELOW
CAUTION: BRITANNIA MELTS AT 430° F. DO NOT OVERHEAT
STEP 1: DEVELOPMENT OF THE BODY
BASE DIVIDED INTO 12 PARTS AND SPACED ALONG THIS CURVE
STEP 8: FILE HANDLE TO FIT BODY. WIRE AND PLACE HANDLE VERTICALLY. HEAT HANDLE AND BODY EQUALLY WITH SMALL FLAME.
STEP 9: POLISH
STEP 4: BASE CUT 3/16" LARGER IN DIAMETER THAN BODY, SOLDERED AND SURPLUS METAL REMOVED
FLUX WELL
STEP 3: SPOUT WIRED, FLUXED AND SOLDERED. FILE SMOOTH INSIDE
BUTT SEAM
ALTERNATIVE
FILE V CUT ON BENDING LINE
STEP 5: SAW TWO PROJECTING 1/8" BEYOND CONTOUR OF HANDLE
STEP 6: CUT AND BEND TWO STRIPS IN EXACT CONFORMITY TO CONTOUR OF HANDLE
STEP 7: BIND; SOLDER AND FILE SURPLUS METAL FROM SIDES

PLATE I.

**The Projects.**

The subdued lustre and the soft neutral tint of Britannia harmonize with any scheme of decorative coloring. As a substitute for electroplated ware, we shall be well content with solid and evident Britannia and possibly feel a bit safer from theft.

Old pewter forms took the shape of plates, snuff boxes, porringers, hanging wash stands, beer mugs, and the like. As pewter ousted wooden utensils from the kitchen and table, so china supplanted pewter. We have left a wide range in tea sets, coffee sets, and other hollow ware, water pitchers, finger, berry and salad bowls, spoons for special uses, vases, lighting fixtures and lamps, desk sets, hardware, and ecclesiastical services.

As I have already indicated, I believe beaten and raised projects, bearing the imprint of individuality are best adapted to the aims of an art metal course. While soldering was "taboo" to the medieval craftsmen, it is necessary to use it in elementary problems, and for the time being, disregard this prejudice.

**The Problem.**

Plate 1 is intended as an introduction to the processes of bending, seaming and soldering applied to a creamer with solid handles. A full size working drawing should be designed in which it seems to be wiser to restrict the body contours to either cylindrical or conical shapes, severe in outline.

As there is a limited amount of bending in this first problem. No. 1 Britannia of 18 gauge, B & S, is satisfactory, with one-fourth pound of lead-tin solder which comes in thin strips. If the design is cylindrical, cut a rectangular blank with the tinners' snips, measuring in one direction the height of the body plus one-eighth of an inch for trimming and the diameter of the body times 3.14 for the remaining dimension. If the body is cone shaped, Step 1 shows the customary method of developing the pattern, adding one-eighth of an inch for trimming.

By the use of the hands and a flat wooden mallet, the body is shaped over a bracelet mandrel or the horn of a blacksmith's anvil. The edges are filed to a perfect butt joint, and the body is wired with medium iron binding wire, as shown in Step 2, taking particular care to note method of wiring conical surfaces.

A CREAMER OF BRITANNIA WARE.
(Courtesy, Reed & Barton.)

MODERN PITCHER OF BRITANNIA WARE.
(Courtesy, Reed & Barton.)

Next, the strip solder is cut into one-eighth inch snippets and placed approximately one-eighth of an inch apart along the seam, as indicated in the illustration. The flux for Britannia preserves the surfaces from oxidation and is made by mixing one ounce of glycerine with five drops of hydrochloric acid. This mixture is applied freely to both sides of the seam and to the solder.

Soft soldering is simple and successful if the following rules are followed.

1. Flux should cover and permeate all parts of the seam and solder.

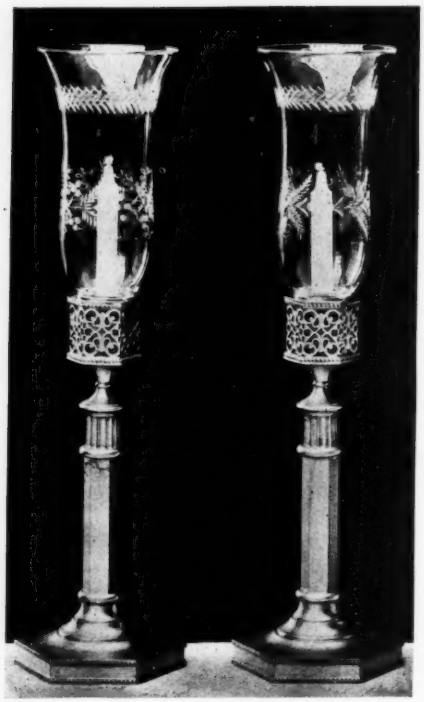
2. Absolute cleanliness is necessary. Both seam and solder should present bright, clean surfaces.

3. Solder flows towards the hottest area. It is then obligatory to play the flame on the larger mass, letting the heat radiate and be transmitted to the smaller mass. This insures uniform heating, the most important essential to good soldering.

4. To avoid melting Britannia, use a small flame varying with the size of the article. The difference between the melting points of the metal and the solder is slight.

5. If light is seen through a seam, the chances are that capillary attraction which causes solder to enter seams will not be strong enough to make the seam tight.

Apply these rules to Step 2. As both halves of the base are of equal area, the flame may be located directly under the seam, moving continuously from end to end until the solder is flushed. Note that in order to draw the solder *through* the seam, and as solder always flows towards heat, one should place the flame *under* the seam.



CANDLE STICKS OF BRITANNIA WARE.
(Reed & Barton.)

After soldering, true the body by placing it on the mandrel, and with a wooden or raw hide mallet tap it lightly into shape. The body is turned slowly clockwise on the mandrel, and the hammer should start at one end while the body is rotated and fed slowly under its blows, thus making a continuous spiral of hammer strokes throughout the entire length of the body.

Step 3 is concerned with the spout. Here the "trial and error" method may be used by cutting and bending a strip of paper into the proper shape for the spout. Using this as a pattern, cut the metal which is then wired and soldered in position and filed true. Again and for the same reason as before, the flame is applied from beneath. As an alternative method, a strip of hard maple may be cut into the shape of the desired spout, and the spout forced into the depression by a process termed "lipping." The advantage of this method lies in the fact that both spout and body are of one piece.

Steps 5, 6 and 7 give the formation of the hollow handle. By omitting the spout and adding another handle, a sugar bowl may be added to the set. The circular base and the handle may be wired at the same time as in Step 8 or attached with separate wirings (Steps 4 and 8). The flame position for the bottom plate is clearly shown, as well as the surplus metal which should be filed off. For heating the handle, place the body on its side, leaving the handle in such a position that the snippets of solder will not fall from position. Heat the body *around* the handles with a gentle flame. As a precautionary measure, it is well to place a wire around the spout. This is to cause it to retain position if the heat becomes intense enough to start the solder.

Note the twist "A" in Step 8. This allows one to tighten the wires not only where the ends meet but in the center of the opposite side as well.

**Finishing.**

Final finishing by filing calls for the use of smooth single cut files, both flat and half-round. A triangular scraper is useful in removing large lumps of solder, although a perfectly soldered joint should show few imperfections of this type.

Britannia will take a brilliant attractive polish, or it may be dulled to a scratch brush finish. If the former is desired, use the usual tripoli felt buffs to remove scratches and file marks, finishing with the rag buff and stick rouge.

A dull finish is obtained by working over the surfaces with fine emery cloth, lubricated with a mixture of half linseed oil and half turpentine. A final rub is supplied by fine pumice and water, working with a rotatory motion to give uniform texture to the surface. The latter finish closely approximates the appearance of ancient pewter, inasmuch as the housewife used Bath brick and wood ashes or sand with which to keep her pewter ware clean. Hammered surfaces will be considered in a later article.

A COFFEE URN OF BRITANNIA WARE
MADE BY REED & BARTON.

# Standards for Judging Demonstrations

Prof. D. J. MacDonald, Ohio State University.

(Conclusion)

**How Long Should a Demonstration Be and What Should Determine Its Length?**

I MIGHT say, arbitrarily, that no demonstration should be more than from three to five minutes in length, or something of that character, if by so doing I did not practically deny the existence of individual differences in pupils as well as the wide varieties of types of demonstrations. The truth of the matter is, demonstrations one minute in length are sometimes too long, while five or more minutes is none too long in other cases. It depends upon (1) the relative simplicity or complexity of the act or series of acts which constitute the demonstration; (2) the degree of familiarity that the learner has with it or kindred performances; (3) the speed with which it is done; and (4) the kind and nature of comment accompanying it. If the demonstration is relatively simple, or if the learner has already become familiar with certain phases or steps in the series of acts which make up the demonstration, the length of time per demonstration may be increased proportionately. But if the above conditions do not prevail, it is safe to say that less rather than more than three minutes is preferable. In fact, the shorter the demonstration the better, provided it is well done. Long observation has satisfied me that the majority of shop teachers err on the side of giving too long rather than too short demonstrations.

I am reminded in this connection of seeing a prospective teacher indicate how she would teach pupils to make a special type of buttonhole. Imagine my surprise when I noted that 23 distinct operations, each accompanied by some specific statement, were necessary to completion of the job and that this teacher fully expected that her pupils would not only remember the 23 distinct operations but would remember them in their proper sequence. Of course, this is a somewhat exaggerated case. But not so much so as the careless observer might assume. For, as a matter of fact, hundreds, yes, thousands, of shop teachers are daily making the same mistake. Indeed, it is but a few short years when educational theorists encouraged exactly such unwarranted procedure as the above through their strenuous opposition to a written sequence of operations, their ludicrous contention being that to indicate to a learner the next operation he should perform would necessarily deprive him of the opportunity to develop the associative areas having to do with thought.

One of the best teachers it has been my privilege to see, sought to justify an eight-minute demonstration on the grounds that it could not well be done in a shorter period. The questions in my mind all of the time were: How much of the demonstration was of such a nature that it did not merit special attention or emphasis of any sort? What parts of it as given might be taken care of before class in view of the fact (1) that the subject had been considered in previous lessons; and (2) that special reference to these details in connection with the demonstration tends to befuddle the learner's mind and thus render it less competent to attend to the unfamiliar features of the demonstration?

The following analysis of a teaching job, how to use a hand saw, illustrates well what I have in mind. Unless the teacher has thought the matter through very carefully he is almost certain to stress non-essential and neglect essential points, not to mention calling attention to tricks of the trade before the learner has had a chance to gain first-hand information through trying to use the tool. Analysis of jobs, in the manner indicated below, will go far to obviate any unnecessary and harmful cluttering of the learner's mind with useless details.

**TEACHING HOW TO USE THE HAND SAW.**

| Essential Ideas. | Objective. | Non-Essential Ideas. |
|---|---|---|
| 1. Piece of wood must be firmly held. | Handle saws so that results will come easily and quickly. | 1. How saws are made. |
| 2. Hold saw at proper angle. | | 2. The various kinds and makes of saws. |
| 3. Grip handle of saw properly. | | 3. Different qualities of saws. |
| 4. Start saw by placing end of free thumb at point where cut is to be made; hold side of saw near end of blade close to end of thumb and push down sharply but firmly until cut is well started. | | 4. Various uses to which saws may be put. |
| 5. Draw saw up and down with easy motion. | | 5. How to file saws so that they may be used satisfactorily on different kinds of wood. |
| 6. Exert pressure only on down stroke. | | 6. How to care for saws properly. |

Teachers of manual subjects would do well, in my judgment, to check themselves carefully on this point. As one prominent writer says, if a good teacher cannot get a demonstration over at least fairly well—assuming, of course, a normal and interested group of pupils—the chances are strong that the demonstration is either untimely or needs to be reduced to lower terms. The majority of teachers of shop subjects would accomplish very much more when with the class if they gave more thought to their work prior to the class period. I am satisfied that no group of teachers give less constructive thought to their work outside of class than do teachers of shop subjects. Only rarely does one find a teacher in this field who is seriously concerned about the psychological principles involved in teaching his subject effectively. In justice it must be said, however, that these teachers are not wholly to blame for this state of affairs. For, with few exceptions, teacher training institutions of various types have either ignored or overlooked the vital interests of the teacher of manual subjects, the re-

sult being that the few who have registered for courses in educational psychology have not only become disgusted because major attention was given to academic subjects but have acquainted other progressively inclined ones with the treatment received. I consider it anything but a compliment to leaders in the field of manual arts that no first-class text has yet appeared on the psychology of manual subjects.

The question as to what teachers should do in case their pupils have difficulty in remembering the sequence of operations involved in the job has long been a favorite subject of debate among theorists. Not so, however, is the case of the practical-minded student of teaching problems who long has stood strongly for placing in front of the learner a statement indicating the sequential order of the different operations involved in the entire job. Personally, I am unable to see where the out-and-out theorists have a leg to stand on in this controversy. To expect learners to recall in proper sequence the several distinct operations of which a job consists and to do it after one or two exposures, so to speak, is so unreasonable that it is absurd. The average learner can no more do it than he can fly. So why waste time debating it? Far better would it be to consider the evil results which inevitably come from literally forcing learners to stand idly about while the much-harrowed teacher attempts to direct the energies of a room full of pupils each of which is engaged at a different task. I have often remarked that if teachers of manual work are required to answer in the next life for sins committed here, then some of them had better begin to prepare for the ordeal. For as surely as the sun rises and sets many of them are directly responsible for their pupils acquiring wrong work habits. Needless to say no small factor in bringing about such evil results is the failure to place before pupils the sequence of operations involved in the jobs they are doing. To me the argument in favor of placing the written sequence of operations in the learner's hands, at least during the period when he is becoming familiar with the tools, equipment, materials, etc., is unanswerable.

In this connection the published suggestions or regulations of one of our largest cities regarding methods of teaching shop subjects may well be cited. These suggestions are:

The general plan for each lesson or class hour formula is:

1. Demonstration (15 to 20 minutes). Consider three or four outstanding features needed by all in the class: (a) High points for all in class considered; (b) minor details left for individual instruction.

2. Summarize the demonstration: (a) Questions and answers; (b) quiz; (c) instructions for work.

3. Observe class as a whole for five or six minutes to see how pupils react to the demonstration: (a) Do not help until you see an individual will not find his way out; (b) make pupils feel the specific need for instruction.

4. Have each boy plan the next step and get the instructor's approval of it.

The statement which bears directly upon the point under discussion is obviously the one that a demonstration of from fifteen to twenty minutes should precede any experimentation or trial on the pupils' part. From what has been set forth above it is apparent that I can not sanction such procedure, and for the simple reason that it is not only unpsychological but uneconomical. In the first place, it may be asked if such procedure does not violate the fundamental principle of learning mentioned later in these same regulations, namely, "Do not help until you see an individual will not find his way out." Does not good teaching demand that at the earliest possible moment the learner shall be led to realize his need for help?

Apparently those responsible for the above regulations fully appreciated the value of this principle. Otherwise, how account for the statement that: "pupils should be made to feel the need for instruction." How then, I repeat, can the procedure of spending so much time upon demonstration preceding participation or trial on the pupils' part be justified? To me it seems not only inconsistent but indefensible.

**The Factor of Speed.**

"Should I demonstrate rapidly or slowly?" is a question frequently put by teachers to teacher trainers. And like many other questions it cannot be satisfactorily answered until the nature of the demonstration and the stage of advancement of the learner are known. To illustrate, a demonstration might conceivably be given for no other purpose, under certain conditions, than to show one already familiar with a job how rapidly he should do it. Again it might just as conceivably be given for the usual purpose, namely, of acquainting the learner with the nature of a certain performance. Needless to say between these two extremes are numerous possibilities which partake in varying degrees of each other. The nature of the act or job to be demonstrated is another factor to be considered before answering such a question. Just how, for instance, could one handle a hammer, or a hand ax, or a buck saw, or a shovel, etc., so rapidly that the learner would be unable to observe and acquire the very things he most needs in order that he may proceed? On the other hand, how easily one might make rafters for a building, or set cutting tools, or manipulate keyboards, or adjust a machine, etc., in such a way that the learner would be totally unable to "catch on."

Obviously, therefore, the first thing necessary is a more careful defining of terms and conditions. If the demonstration is arbitrarily limited to use in teaching beginners, then but one variable, whether the job is inherently slow or fast, remains. And since this probably comes closer to school conditions than any other position

that might be taken, I shall make this the point of departure. If jobs are of such nature that they cannot be performed too rapidly (see illustration cited above) then there is no question. This is far from saying, however, that the teacher's job is finished when the necessarily slow demonstration is complete. Ordinarily there is need for more, and not infrequently, even better teaching after than before a demonstration.

If the jobs are inherently fast, when carried through at the usual rate of speed, then the only thing to do, provided it is essential that the learner observe details of the total performance, is to slow down sufficiently to make this possible. The great danger here is that teachers will overdo the pointing out of details rather than leave it to the pupil to grasp what he needs before trying his hand at it for the first time. Once he has tried more or less successfully to do the job, the danger of overemphasizing the details made visible through reducing the speed is correspondingly lessened. This, it seems to me, reduces the question to its lowest terms and places the responsibility where it rightfully belongs, namely, on the individual teacher's shoulders. It is he, and he alone, who is in position to know how rapidly a particular demonstration should be performed. No one else can size the situation up for him.

**Degree of Skill Which Should Be Exhibited.**

Upon first thought the average student of teaching methods would doubtless maintain that the higher the degree of skill exhibited in any demonstration the greater its teaching value. And in all probability this position is largely defensible. At any rate until the experimental psychologists provide evidence to the contrary this viewpoint is certain to prevail. It is entirely fitting, however, for us to remind ourselves in this connection that in the last analysis the worth or value of any teaching device is two-fold, namely,

(1) Its appealing ability or inspiring power, and (2) its instructional power. Does it not follow, therefore, that any device may fail in either or both respects? And, if this be true, then does it not follow also that an exhibition of skill, which, it will be granted, is merely one type of teaching device, may fail in either or both of the respects specified. That is to say, it may not inspire or inform as it should and might, which failure may be directly attributable to any one or a combination of the following: (a) the manner of execution is so skillful, in the sense of rapid, that the learner cannot gain through observation the information necessary to enable him to progress as he should. (That skill inevitably involves speed will not be denied though some may fail to see at once that it involves it so intimately at times that its identity is largely lost without it. Numerous illustrations might be cited in support of this rather common relationship.) It need not be added that if reducing the speed of execution is essential to the gaining of necessary information then it must prevail regardless of the fact that maximum skill cannot be exhibited apart from considerable speed. (b) The manner of execution may be so skilful that by reason of its very perfection, instead of inspiring, it has exactly the opposite effect upon certain types. This, by the way, is a statement of fact and not of theory. "Oh, what's the use? I can never do it that way," is by no means an uncommon remark. That the spirit which prompts such a remark is as far removed as can be from the spirit essential to genuine progress is not even open to debate. The inference I wish drawn from the foregoing is that skill as a device or medium in teaching is no exception to the rule, namely that both subject matter and method should be graduated to the learner's increasing ability to comprehend and attain. If, as we all know, the do-or-die spirit is what pupils should feel and manifest toward their tasks then teachers should not, by reason of their methods, promote the exact opposite. I grant that the number of cases where discouragement results, because a high degree of skill is exhibited by the teacher, is probably relatively small. This does not, however, affect in the least the validity of the previous statement. (3) The manner of execution may lack the elements of skill to such a degree that it may fail both to inspire and inform, the former because of its unidealistic nature, the latter because of its inaccuracies, or inadequacies of other character from which erroneous ideas are gained. This being the condition which commonly prevails in one form or another it will suffice to say that all exhibitions of skill should first of all tell the truth, as Ruskin would insist, and second, that they should inspire—this latter at least partly by reason of this truth.

In this connection consideration should also be given to the matter of emphasis. I refer to the expenditure of time and effort in a manner and to a degree consistent with the exigencies of the case and with the standards which prevail in commercial life. For example, while lettering on mechanical drawings is important, it is not important to the extent that an undue amount of time and effort should be devoted to it. Teachers must comprehend fully the purpose of lettering as a phase of training, then give it only the time and attention it deserves. Oh, the hours and hours of time which have been wasted on lettering for no other reason than that teachers have over-valued its importance in the scheme of things. If a standard good enough for commercial purposes has been attained, would it not be more sensible to devote the available time to acquiring other necessary facts, skills, etc., than to acquiring undue proficiency in lettering? I cannot but favor the implied point of view.

**Respective Relation of Demonstrator and Learner to the Demonstration.**

How well I remember the shock I underwent when after making a study of teaching principles in everyday situations I went into some shop classes and saw this very usual thing, teacher after teacher facing their pupils while giving a demonstration. The inevitable result of such procedure was naturally enough a con-

fused state of mind in the learner. How could it be otherwise under the circumstances. Even the superficial observer has noted the confusion under which he labored when for example, he tried to figure out while facing the demonstrator how to make a bow or four-in-hand knot in his tie. The truth of the matter is the average person, at least this is true of men, has real difficulty in learning how to tie a bow knot when facing a mirror. Many persons, in fact, get along much better even after years of experience, without a mirror than with one when, for example, they are going through the movements of tying a tie. In view of this, does it not follow that teachers should utilize every means to relate themselves to the thing being demonstrated in such a way that their pupils will not have to undergo the "mirror" adjustment, so to speak? Certainly, until they do this they can be justly accused of violating one of the most fundamental principles of teaching.

It is recognized, to be sure, that certain valid objections can be raised to the strict observance of this principle. But such objections, when put under the microscope, fail to compare in significance with the great positive values accruing from the method suggested.

**Calling the Learner's Attention to Guide Posts or Goals.**

It is trite to say that human learners—other things being equal—will progress in proportion, or to the degree, that the end in view is made clear to them. To this end, obviously, teachers demonstrate, in one form or another, what to do, as for example, exhibiting a completed product. Observation has convinced me, however, that despite the obviousness of this principle it is frequently violated. The following illustration will make clear what I have in mind: In the trade of pattern making one of the fundamental principles is that relating to draft. That is to say, on each part of every pattern sufficient taper or draft must be allowed to make possible easy removal of the pattern from the sand or mould.

Since this principle is so fundamental in this trade and since, too, it is elemental rather than advanced, it is taught in the socalled beginner's course. If I have watched beginners in patternmaking once I have a hundred times when it was clear to me that their main difficulty was lack of adequate information (1) as to how each successive step contributed to the whole and (2) as to the absolute necessity of taking each step when and in the specific way it should be taken. Thus, provision of draft in a pattern will not alone bring satisfactory results; in addition, the wood or metal of which the pattern is made must be free from irregularities of all kinds and must have the type of surface when completed to which moulding sand does not readily adhere.

If these teaching points are summarized, it is found that they are four in number: First and foremost, that the pupil must ever keep in mind that the pattern must be so constructed that when the time comes to remove it from the sand it may be removed without disturbing in the least the sand contiguous to it; second, that the pupil must not only see that the pattern has draft but that this draft is regular rather than irregular; third, that the parts of the pattern which must come in contact with the sand must be quite smooth; and fourth, that the surface of the pattern, especially where it is to touch the sand, must be such that sand does not adhere readily to it. In other words, in order to teach this phase of pattern making properly, a teacher must not only see these different points clearly but must be in command of the technique which enables him to detect and observe them in proper sequence. Specifically speaking, he must not only appreciate the importance of making the final goal clear to his pupils but as well each of the equally important preceding goals.

**Summary.**

1. The demonstration method of teaching is doubtless the most widely used of all methods; it is also doubtless the easiest and most satisfactory method when all things are considered. Basically, the method involves on the learner's part the use of the same powers and capacities as any other method though, of course, to a different degree. It follows, therefore, that all teachers, but particularly teachers of shop subjects, should be well grounded in the psychology of learning as applied to manual activities.

2. A demonstration should be given at that period of the learner's experience when the need for it is greatest. When applied to life, this is equivalent to saying that unless the conditions surrounding the situation are such as to make it seem entirely inadvisable, the pupil should be allowed to try to do the thing, e. g., use the plane, or saw, or draw knife, etc., following a very brief demonstration on the teacher's part.

3. In case the unit of work to be taught is of such length that it is impossible for the learner to remember and recall in order the steps necessary, and in case further, the unit cannot be conveniently subdivided, then a written statement indicating the proper sequence of steps should be placed before the learner.

4. Of exceeding importance is it in teaching by the demonstration method that the explanatory remarks accompanying the demonstration be limited yet adequate.

5. Demonstrations should be given at the rate of speed that will convey most to the learner. In other words, some should be given slowly, some at medium speed, and some very rapidly. Where the work is inherently fast, as is not infrequently the case, then it must be slowed down to the point where the phases which need to be comprehended may be comprehended. Should this adversely affect the product, the only alternative is to point this fact out to the learner.

7. In the main, demonstrations should always be conducted with all possible skill. It must be remembered, however, that the worth of any teaching device is two-fold, namely, to instruct and to inspire, and that, therefore, a demonstration may be given so skillfully

that it defeats its own purpose because it discourages rather than encourages the learner.

8. When demonstrating it is important that the demonstrator relate himself to his work in such a way as to make it easy for the learner to grasp the significance of each step taken. Should this necessitate, as it often does, sacrifices in the way of skill or form, all well and good. The all-important thing is to help the learner to get a conception of the job as a whole and to do it without too great difficulty on his part. Specifically, this means discontinuance on the part of teachers of the all too universal practice of face to face relationship with pupils when demonstrations are being given.

9. Establishing definite goals for learners to work toward is fundamental to good teaching; likewise, is it fundamental that pupils shall be led to see relationships between the more immediate goals and the final goal. This involves on the part of teachers thorough analysis of the job to be demonstrated and careful evaluation of each part to the end that a proper method for teaching it may be worked out. Prominent in this method will be the pointing out of goals that must be successively attained and emphasizing the fact that the joy of ultimate attainment will never be experienced except the learner successfully attains each of the preceding goals.

# A Drill Press as a Machine Shop Problem

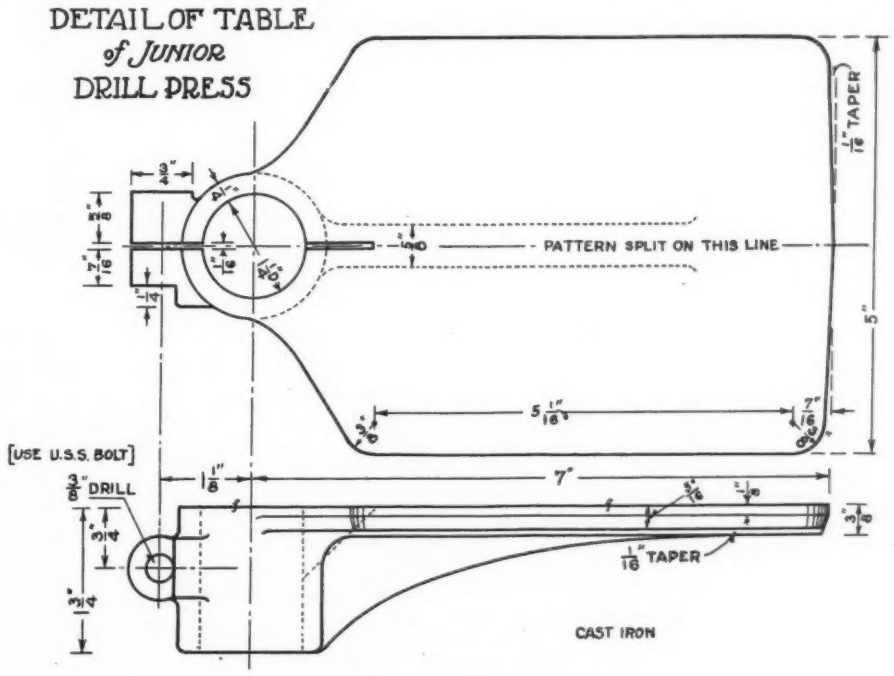
Robert S. Condon, Decatur, Ill.

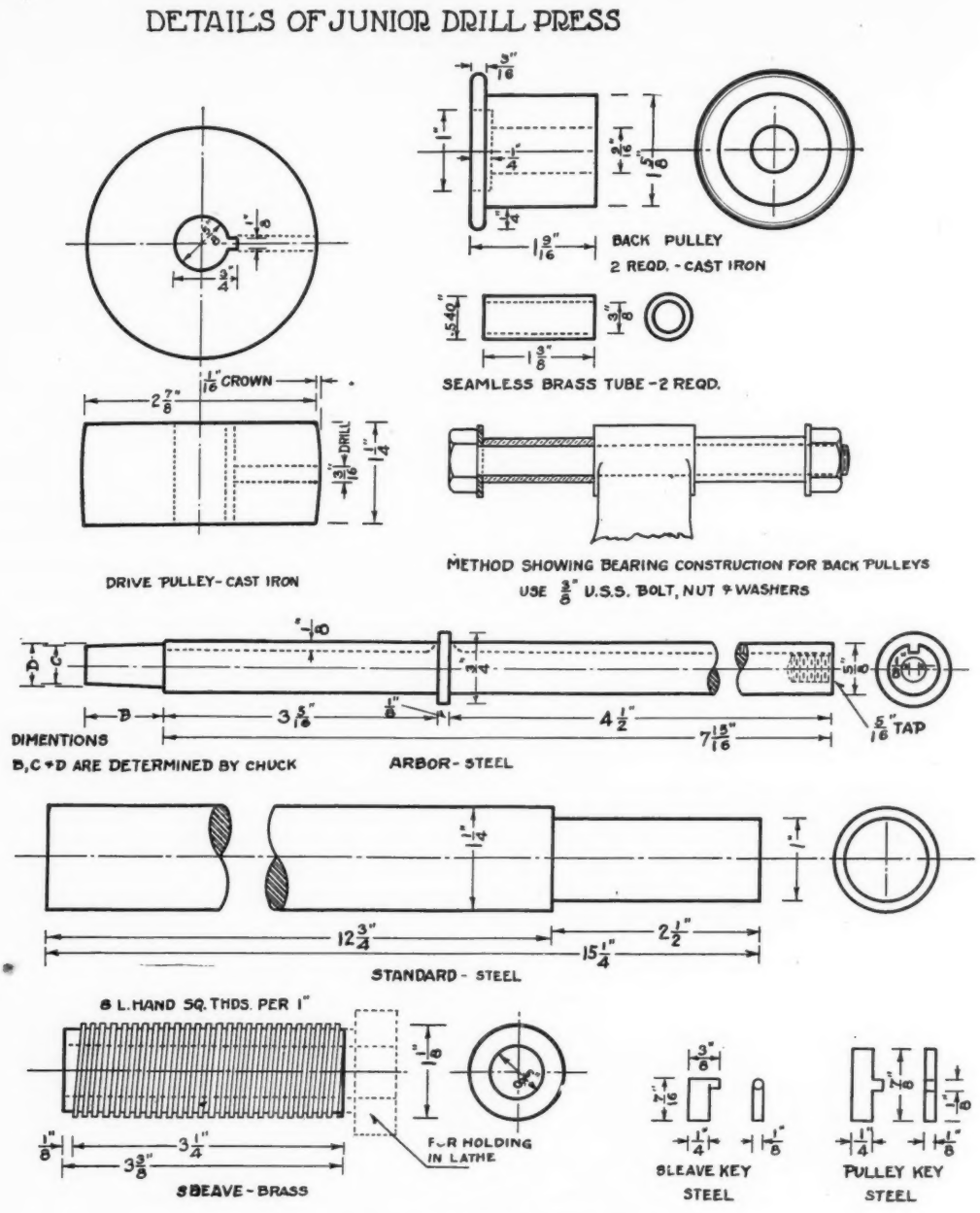
MODERN progress in the field of industrial arts has brought and added metal working to the well known work in woods. And machine shop practice has become a vital branch of the metal working arts. There is a need for designs of projects that are suited to the machine tool equipment of the school shop and the varied training that the classes may receive. Students have a wholesome desire to make something big and worth while, but projects that appeal to the student and are of suitable design, that will not demand processes of manufacture too intricate to insure a fair degree of success, are not common. The drill press here described has excellent qualities for school shop production:

In the manufacture of a small drill press in a class in elementary machine shop practice an advantage is gained by choosing a design that does not necessitate intricate and complicated machine tool processes. The junior drill press shown in the accompanying drawings can be made with the use of the lathe and shaper only. In the design of the vertical feed mechanism (see assembly drawing) small parts have been eliminated and the customary gear is replaced by a threaded sleeve to facilitate ease of construction.

A positive vertical feed of the drill is accomplished by a wheel which slips on over a flange of the head piece and is threaded to receive a brass sleeve. The sleeve is keyed to the head piece. Thus, a turning of the wheel raises and lowers the sleeve, and the sleeve determines the position of the arbor.

The lower end of the arbor is machined to receive a chuck. A chuck may be purchased that will receive



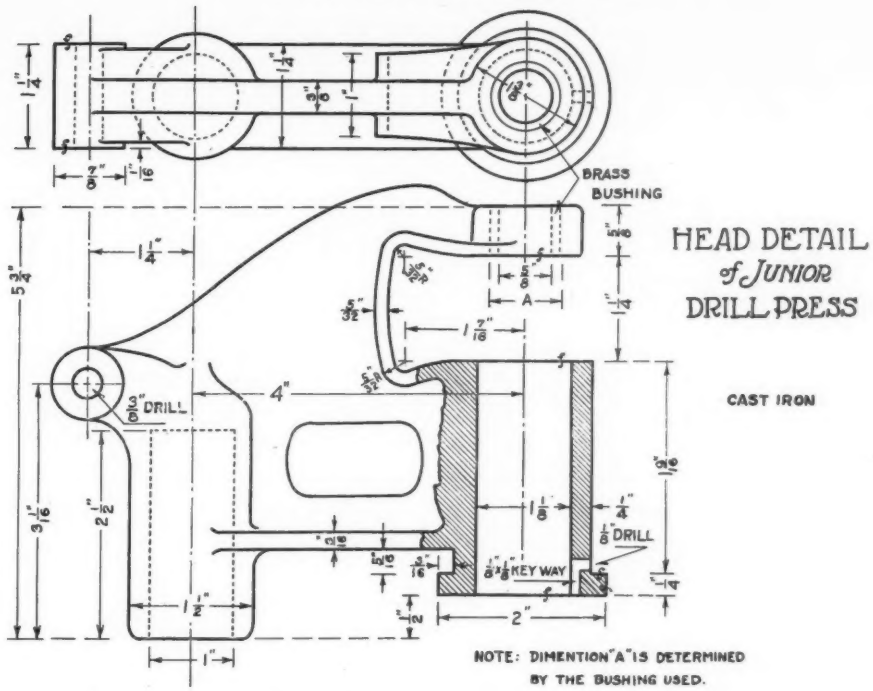

DETAILS OF JUNIOR DRILL PRESS
BACK PULLEY
2 REQD. - CAST IRON
SEAMLESS BRASS TUBE - 2 REQD.
DRIVE PULLEY - CAST IRON
METHOD SHOWING BEARING CONSTRUCTION FOR BACK PULLEYS
USE 3/8" U.S.S. BOLT, NUT & WASHERS
DIMENTIONS
B, C & D ARE DETERMINED BY CHUCK
ARBOR - STEEL
5/16" TAP
STANDARD - STEEL
8 L. HAND SQ. THDS. PER 1"
FOR HOLDING IN LATHE
SHEAVE - BRASS
SHEAVE KEY STEEL
PULLEY KEY STEEL

DETAILS OF A JUNIOR DRILL PRESS.

drills up to ¼ to ⅜ inches. A ball-bearinged chuck is advisable but not necessary, since the friction caused by the pressure of the thrust of the chuck is taken up on the end of the brass sleeve which gives a good bearing surface.

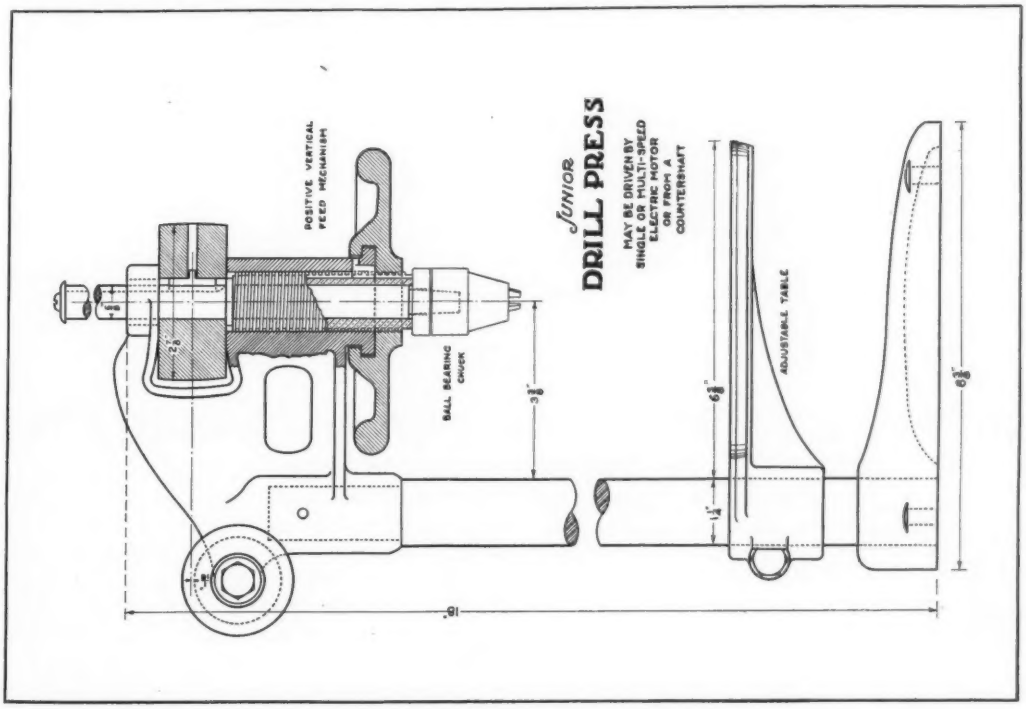
A 1¼ inch drive belt, which drives the arbor over a pulley 1⅞ inches in diameter, is provided for in the drawings. The electric motor (which might well be a multi-speed fan motor) or the countershaft which would serve as a source of power for the drill press has been omitted.

The bearing for the back pulleys is formed by two pieces of seamless brass tubing 1⅜ inches long, the tubes together with two washers are secured to the head piece with a U. S. S. bolt. A lock nut may be provided for this bolt if necessary. The bearing hole in the back pulleys is larger and shorter than the pieces of tubing so that the tubes form perfect shafts for the pulleys. The arrangement of these bearing shafts is shown in a sketch with the drawings of the pulleys. The seamless brass tubing, mentioned above, may be purchased locally. The pieces needed are ¼ inch size because it is sold according to iron pipe sizes.



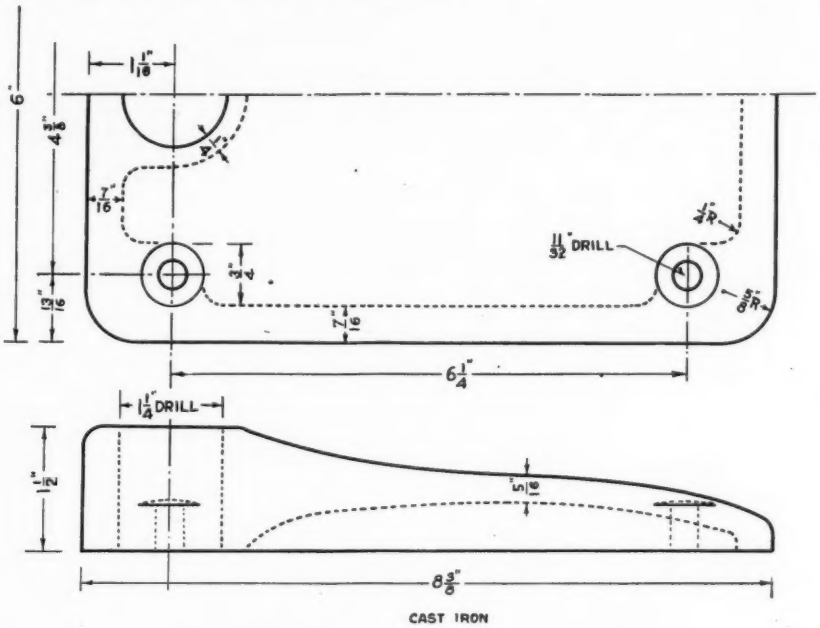

The base may be "shrunk" on the standard or secured with a set screw. A U. S. S. bolt is used to clamp the adjustable table to the standard. One side of the head of this bolt is ground away, and a lug is provided on the left side of the table, so that the head of the bolt will not turn when the nut is moved. The head piece is secured to the standard with a rivet.

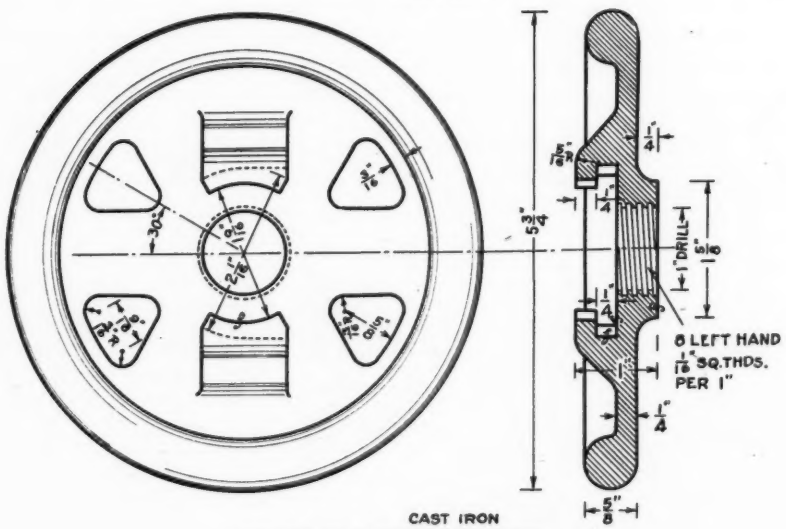
The positive vertical feed mechanism is assembled as follows: (Refer to the assembly drawing.) The sleeve is placed upon the arbor and the chuck is securely fastened into place. (The sleeve must turn freely on the arbor but the "snugger" the fit the better.) The wheel is slipped over the flange on the head piece from the side, the lugs on the wheel fitting over the flange. The sleeve key is put into place in the head piece. The drive pulley key is also put into place in the drive pulley.


JUNIOR DRILL PRESS
MAY BE DRIVEN BY SINGLE OR MULTI-SPEED ELECTRIC MOTOR OR FROM A COUNTERSHAFT
POSITIVE VERTICAL FEED MECHANISM
BALL BEARING CHUCK
ADJUSTABLE TABLE

ASSEMBLY OF THE JUNIOR DRILL PRESS.

The arbor is now thrust up into the head piece, through the wheel and the drive pulley is put into place. The sleeve is then brought into position by turning the wheel and threading the sleeve upwards through it. And finally, the arbor is secured from getting down too far, while the drill press is in use, by a washer which is fastened to the top of the arbor with a round head machine screw.



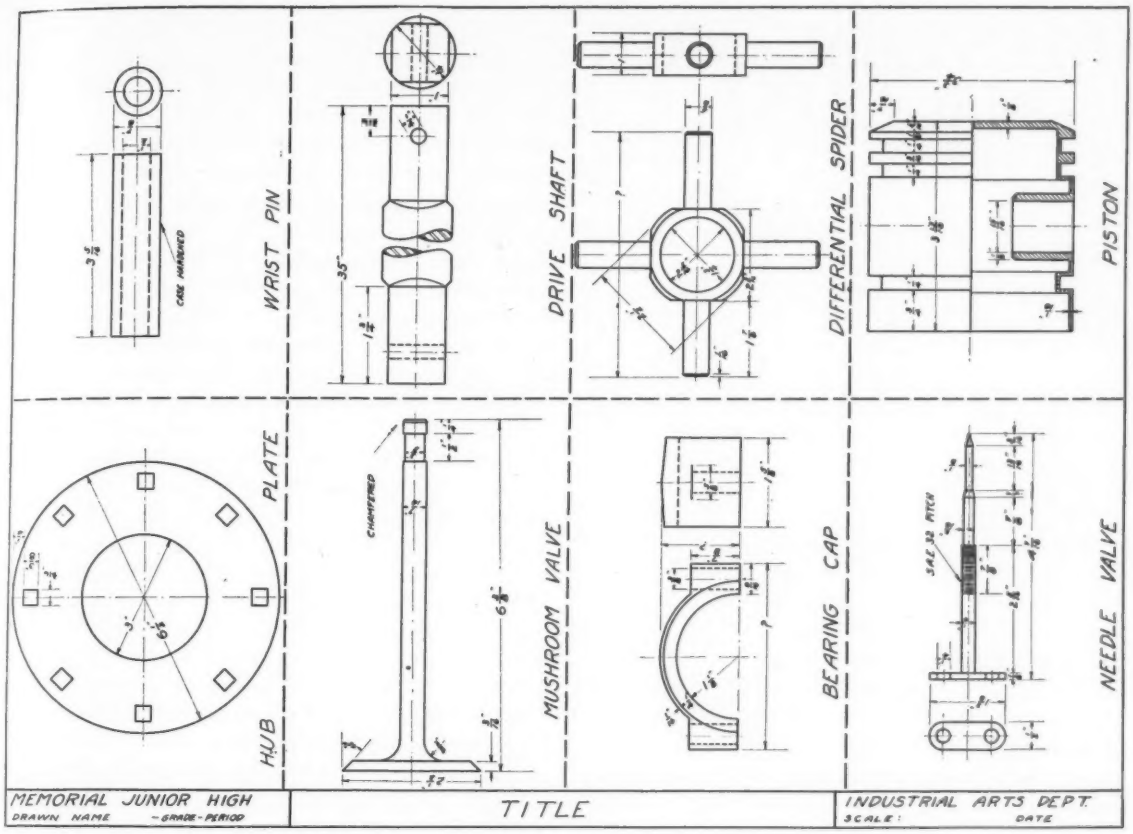

DETAILS OF JUNIOR DRILL PRESS.

# Introductory Plates in Seventh and Eighth Grade Mechanical Drawing

**Paul E. Klein, Memorial Junior High School, San Diego, Calif.**

IN the Memorial Junior High School, we offer two courses in mechanical drawing—one in the seventh or eighth grade and the other in the ninth. The former is an introductory course, and is one of several shop subjects, such as wood work, metal work and printing, which are of an exploratory nature—that is, for the purpose of giving the students an idea of the various industries or vocations relating to them. The ninth grade drafting is the first year in a regular high school course which, in the senior high school, continues through the twelfth year.

An eleven by fifteen inch blueprint, laid out like the accompanying drawing, is furnished each boy regis-




PLATES FOR MECHANICAL DRAWING IN SEVENTH AND EIGHTH GRADES.

tered in the introductory classes. This serves as his guide throughout the first eight plates. He gets the size and arrangement, border, and title, as well as the data on the eight objects to be drawn up full size.

When many of us first took up mechanical drawing we were required to wade through several lettering plates followed by several on straight, curved, oblique, and other more or less important lines, figures, squares, etc. It is felt by the writer that these eight plates will give this practice in the use of tools, while lettering is provided for by requiring the students to place a few pertinent facts concerning the object beneath each drawing. As each is started, it is discussed in class—its purpose in the machine, properties necessary, material, finish, etc. For instance with the spider, we have a complete differential assembly which we put together to see how it works. The accompanying photographs show these eight objects as well as a collection of other automobile parts. We were at no expense in obtaining these for school use—a contest among the boys to see who could bring the greatest quantity, most peculiar, rare, etc., resulted in an overflow. While the preponderance of automobile pieces is an index as to the interest of the boys at this age, the care with which they have executed the various drawings is a direct result of this interest.

It is recognized that these eight objects may, strictly speaking, be said to skim the surface of machine drawing, while to give the students an idea of the whole field of mechanical drawing, other units should be provided—such as ones of an architectural nature. We have provided for this, as but one third of the time allotted for drawing is consumed by these particular plates. It will be noted that several conventions are thrown in—as threads, sections, hatching, etc. No further study of these are made at this time—they are simply touched upon to show their existence in drafting.

## PART-TIME EDUCATION FOR BOYS.

The primary object of all education is to keep the road of equal opportunity open for each youth. Because of poverty, disease, bad home conditions, that road is closed at the age of sixteen for most of our boys and girls. The Part-Time School is one means of keeping that road open for two years longer. Specifically, boys need vocational guidance, not the theoretical guidance we are all familiar with; but in addition to mental tests and book knowledge of industry, they need to be exposed to various trades. In a pre-vocational part-time shop this work can be done. The boy then can be placed in industry, his work watched by the coordinator, and such readjustment made as may appear necessary. In addition to these services, a part-time boy requires an opportunity to get related trade information, most of which could not be given until the boy actually took his place in the trade. The character of this information will vary with the trades. In addition to this bridging the gap between the school and industry, the boy should have health and citizenship instruction—*D. O. Brillhart, Oakland, Calif.*

# INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN

*Editors*


## EDITORIAL

### SOME CAUTIONS FOR THE NEW YEAR.

As Industrial Arts teachers go into the work of the new year in September, they should do so with a consciousness that very great responsibilities rest upon them this year. Many people are just beginning to awaken to the importance of this work, and considerable fear has been aroused lest too great expense may be incurred for its development.

Let us not make any false claims. We must fearlessly distinguish between vocational education and industrial arts or manual arts. We must disclaim any attempt or purpose whatsoever to do vocational work in the elementary schools and in the regular high school courses in manual or industrial arts.

Those who profess to give courses in actual vocational work in high schools must see to it that they really produce the knowledge, technical insight, and mechanical skill that will justify their work in being called vocational.

Furthermore, we must get away from the idea of elaborate and expensive equipments for industrial work in the first five or six grades of the elementary school. For most materials suited to these grades, very little equipment is absolutely imperative. Much of that which is needed may be improvised. The work of these grades must be regarded largely as a means of giving physical and intellectual activity in a constructive way, and experiences and contacts with materials that will make the students familiar with simple elements in the industrial world.

This all means also that the one item of skill is not to be over-emphasized in these elementary courses not designed for vocational purposes. There was a time when everything else was subordinated to the one single purpose of producing skill. Reasonable skill is necessary to the production of satisfactory results in any line of industrial work, but it is not the thing of prime importance. Teachers of considerable experience have learned long ago about what the balance is in dealing with the various elements in a piece of work, like skill, thought content, graphic aids to the thought and work, significance of the work industrially, etc.

The subject of industrial arts may be made one of the broadest and most inclusive subjects of the curriculum, or it can be narrowed down to a few little matters of routine, manipulation, and efforts at producing skill alone. This year the subject of industrial arts should command more respect than ever before from the educators, the taxpayers, and the general public. It can do so only by frankly meeting the problems presented as a part of a general educational scheme for all children. Industrial arts education is for all children—vocational education is for the comparatively few in the public schools. Both are absolutely necessary. Both are absolutely distinct. There is no need of confusion.

### RAISING STANDARDS.

With college authorities there is a growing tendency to eliminate the unfit students by raising standards and so relieve the overcrowded classes and conserve the teachers' time and ability. College standards have now been raised to a point that has taxed the secondary schools in reaching entrance requirements for those who anticipate professional training.

The colleges have more pupils than can be properly taught under present conditions. Raising standards is one method of reducing this number.

The public schools also have more pupils than can be properly taught under present conditions, but the public schools must accept and retain within ages prescribed by law, all students of near normal ability. Rigid and high standards of scholarship may not be established in the common schools for the purpose of excluding those who are normal even though they are a drag on the class work. The raising of standards is not a legitimate remedy for overcrowded public schools.

Much complaint has been made recently by teachers that the greatest waste of a teacher's time and abilities is the dull and indifferent pupil. With crowded classes and a fixed program this waste is inevitable, yet we wonder if a teacher's time devoted to a few exceptional pupils of a class to the neglect of a dull or even average pupil's is not a greater and more prevalent waste.

That public school teacher who devotes his time and attention to a few bright and forward pupils with the thought of raising his standards and reputation may well observe the social and economic result of such a process.

The schools need efficient teaching of the average pupil even more than the conservation of teaching ability under higher standards. The average pupil poorly taught is a menace to society and the schools.

### ALL SET.

Are we all set for the new school year?

Programs complete, materials at hand; mistakes of the past and new ideas gathered during the summer weighted carefully against each other.

The Industrial Arts teacher is not in the situation of the old colored mammy who said she "wasn't goin no wha, cause she has been wha she was goin."

Few teachers have been where they are going or would willingly go where they have been. The teacher is sailing uncharted seas. Even the cardinal directions are hazy for the ship of education. The rudder program is subject to undercurrents and entanglements. Sails must be set against the shifting winds of advice, opinion and criticism.

The experienced teacher has given up the idea of landing all of his precious cargo in one port. In fact they must be landed in as many places as there are passengers. Indeed! they must not realize that they are passengers to be carried into port. They must work their own passage on this trip of nine months with guidance and a little judicious help from the captain. There is one other thing of which the experienced teacher is quite certain. Each passenger must be supplied with a paddle and must apply it himself. Each passenger must work his own passage and must learn to like it. The loafer never enjoys the trip and is most critical of the ship and crew.

### FRUGALITY.

The new school year opens with little relief over the crowded conditions of last year. Many new school buildings have been built and much repair work has been done at excessive prices but the increase in school attendance will make it necessary to economize time, space and money in the business of education.

We have even heard of a few cases of private endowment of the public schools. Of course there has been much money given for special and exclusive educational purpose by philanthropists.

The public schools have not been greatly helped by such gifts and it is not consistent that the schools of a Democracy should be the gift of individuals. More generous allowance has been made in some states for the support of the schools. Much more generous allowance will be made as the needs of education are emphasized. In the meantime teachers are more plentiful than before and salaries have not increased in proportion to expenses of living.

Business and living are now conducted on a most extravagant basis. The conservative business man is seriously concerned. He is hoping for signs of frugality but finds little of it.

American people need education in frugality. The spirit of frugality may well be developed in the schools. Children should be taught to conserve and save. A general reduction in the size of waste baskets is advisable.

Perhaps we can save a little by reducing the social program of the schools. Perhaps we have overdone the athletic program.

Without reducing our working hours or the quantity or quality of work done in past years, may the schools not be the first big business to show a much needed example of frugality?

### THE TEACHER ACCEPTS: THEN WHAT?

There is just a little tendency on the part of some teachers to consider only one form of contract binding, and that form is the written contract. Even with a written contract, it is all too common to hear of teachers who ignore the obligation which their signatures to contracts place upon them.

We have a good deal of sympathy for teachers who find themselves confronted with opportunities, after contracts have been signed, to make vast improvements in their situations by taking bigger and more lucrative positions. There is a perfectly definite and perfectly honorable procedure in such a dilemma. That is to state the case clearly and frankly to the other party to the contract and to ask what the possibilities are for a release. If the other party to the contract—school board, superintendent, principal, or president—takes the position that it is too late, that the chances are too small to secure the proper successor, or that any other condition renders a release impossible, then the teacher should have the courage, the honesty, and the sense of fair dealing to yield the point and to honor his signature to the contract with an honest performance of the terms of the contract.

In the main, school authorities are disposed to be exceedingly generous in this respect. They are inclined to feel that an institution does not depend upon any individual, and that whereas institutions will go on and on meeting opportunities on every hand, the individual has but a limited time in which to improve opportunities presented. They therefore feel that an institution can often profit in the long run by a generous attitude toward the welfare and opportunities of those whom it employs. Yet, in all this, the welfare of the children to be taught is not to be sacrificed to the welfare of any individual. The welfare of all concerned must determine in the end. There is, therefore, scarcely a sound reason that can be mentioned in support of a preemptory withdrawal from a contract that has been entered into in good faith by school authorities. The same statement holds also for the school authorities.

There is another form of contract, however, that is commonly looked upon as of less significance and binding force than the written contract; that is the verbal contract. To be sure, it is much more difficult to substantiate, but it is none the less binding in its moral import. When a teacher *accepts* a position offered, whether by letter, contract, telegram, or simply word of mouth, the moral obligation is absolutely laid upon him to make "his word as good as his bond."

It is not the most uncommon thing to hear such an expression as, "I accepted the position, but then I haven't signed a contract." Which, being interpreted, means that another position will be accepted, if the inducements are sufficiently large. The teaching business can never be a profession to those who look upon it as tolerant of such principles and practices. The schools have a right to demand of their teachers that their word be as good as their bond. Frequently, a considerable time must elapse between the acceptance of a position by a teacher and the signing of a formal contract. In this interim, the schools and school authorities have a right to the feeling of security based upon the teacher's regard for his or her word.

# A Problem in Mechanical Drawing and an Explanation of the Framing Square

**Ed Davis, State Teachers' College, Hays, Kansas.**

"I WISH I knew what all those figures on a square mean. I have been told there is an education in the steel square." This remark has been made in the author's hearing a number of times by students and even by carpenters, who had not mastered rafter cutting.

It seems that to the average person, the square is surrounded with mystery. This has no doubt been handed down from the time before squares were generally used for roof framing. The framer of those days guarded well his knowledge of rafter cutting.

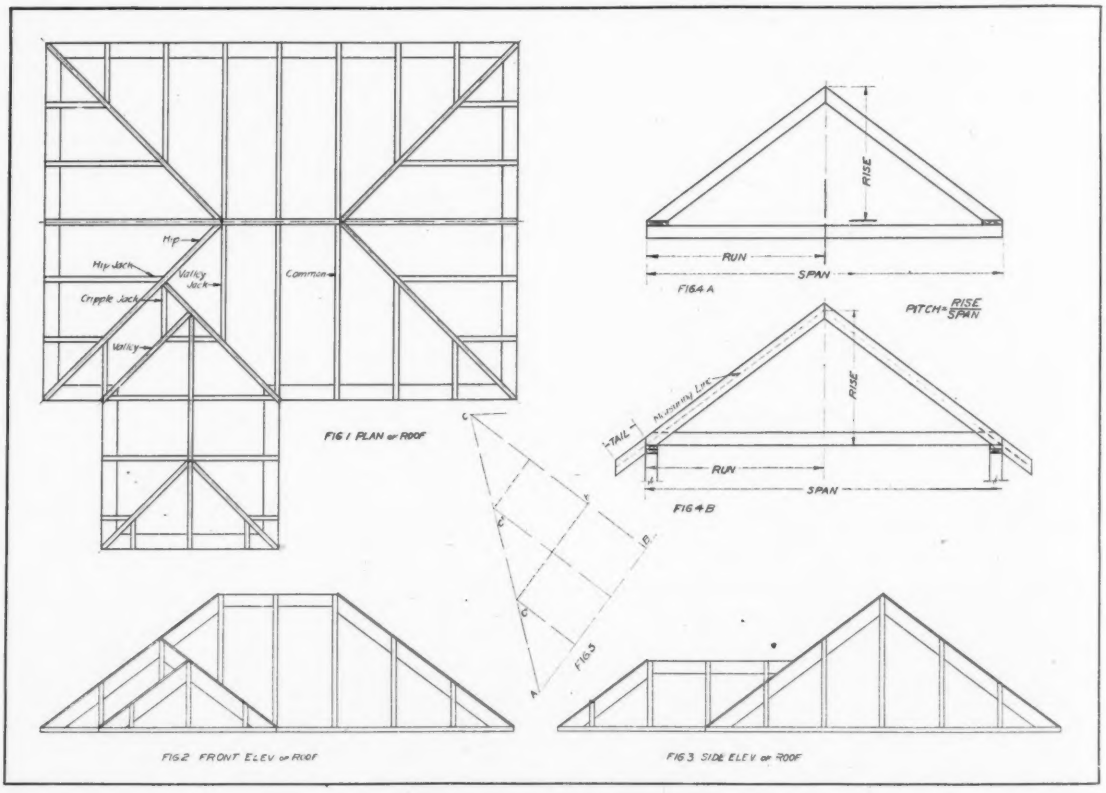
No attempt is here made—except in a general way—to give instructions on the use of the square in roof framing. The manufacturers of squares and inventors of keys to the steel square all give the figures to use for the various cuts. Few, if any of them, explain how these figures were found. The photograph, drawings, and notes is the author's attempt to explain to his students the "mystery" of the square. He believes that one of the best "keys" to the square is the drafting board and the ability to draw any part of a roof he desires. When he can do this a framing square is only a convenience, not a necessity, over an ordinary square.

The problem selected is that of a hipped roof with a hipped projection for a square cornered building. Both roofs have the same pitch. (Roofs with different pitches intersecting and corners of the building other than right angles are not considered in this article.) Any other roof showing the same rafters will serve as well as this. Of course the ideal way is to have students actually frame as well as draw the roof.

Figure 1 is the plan of the roof showing the arrangement and run of the rafters. Two methods of attaching the hips to the ridge are shown.

Figures 2 and 3 show the front and side elevations of roof. The double line at upper edge of hips and valleys is the backing.

Figures 4A and 4B are two methods of placing common rafters. A glance at the drawing shows the roof framed like 4A. Run, rise, span, and pitch are also given. On the drawings where a square is dotted and figures to use to obtain cuts are given, the meaning of these terms are as follows: Run 12" for common and jack rafters; the diagonal of a twelve inch square (16.97") for a hip or valley. Rise, the number of inches the common and jack rafter inclines to horizontal per foot of run. The same number used for rise of hip as for common. Length in inches of common, jack, hip, or valley per foot of run as indicated on drawing. When one uses a framing square he gets the figures for the several cuts under one of the inch marks on the square that bears the same ratio to length of blade (24") as the pitch of the roof. For example, a three-eighth pitch. The figures to use will be found under 9. One of the rows of figures on the square gives the length of comon rafter per foot of run—simply the length of hypotenuse of a right angle triangle having a base of 12" and altitude of the indicated number of inches rise per foot of run. Another row of figures gives




DETAILS OF ROOF PLAN.

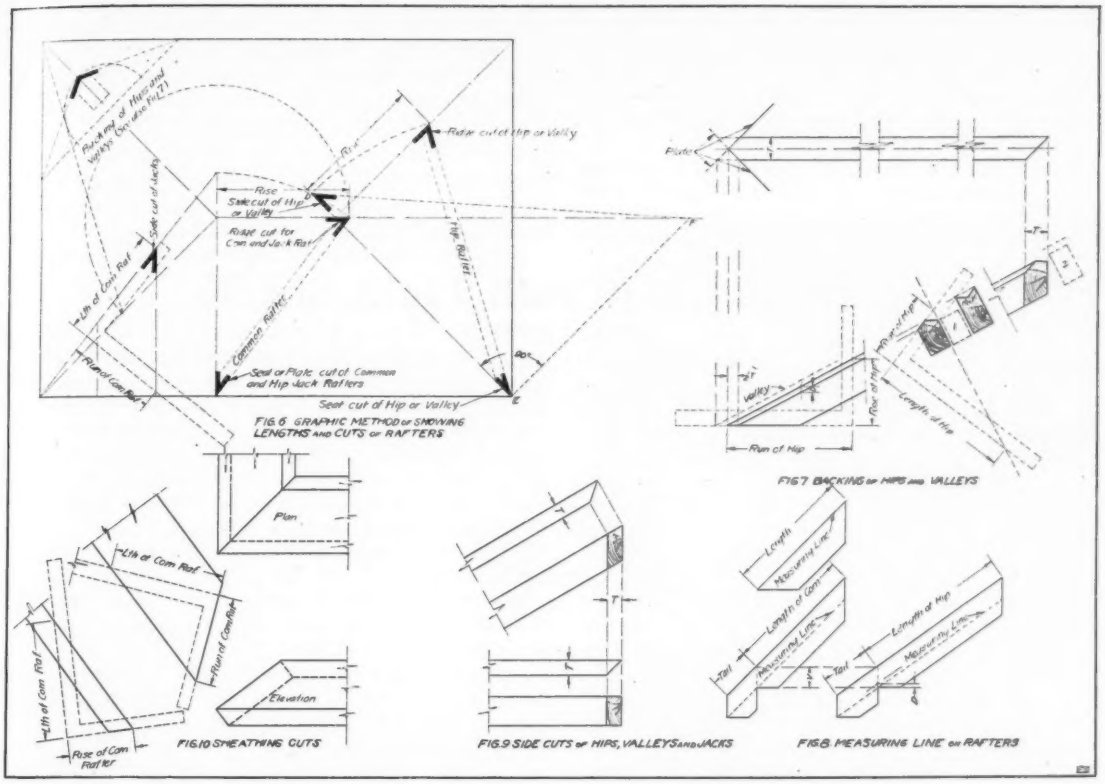



FIG. 6 GRAPHIC METHOD OF SHOWING LENGTHS AND CUTS OF RAFTERS

FIG. 7 BACKING OF HIPS AND VALLEYS

FIG. 10 SHEATHING CUTS

FIG. 9 SIDE CUTS OF HIPS, VALLEYS AND JACKS

FIG. 8 MEASURING LINE ON RAFTERS

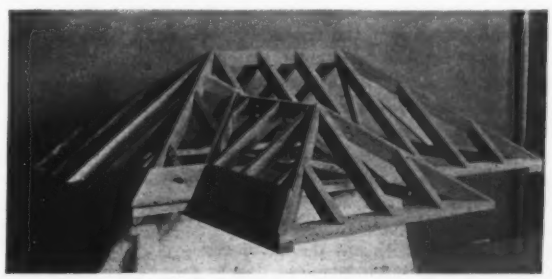
length of hip rafter per foot of run—same as for common rafter except 16.97" used for base of the triangle.

Figure 5 is an auxiliary of one-half of the right end of the roof. This right angle triangle A B C has side AB equal to run of common rafters; BC equal to length of common rafter; and AC equal to length of a hip. The side cut (across upper edge) for jacks, hips, and valleys will always be less than 45° as indicated at C'. The portion of Figure 6 in lower left hand corner shows how the square is applied and the figures used to make this cut. This auxiliary view explains the rows of figures on the square giving the side cut of jack rafters. The dotted lines from C' and C'' to BC also explain another row of figures on the square that gives the difference in length of jack rafters when placed on 16" centers and 24" centers. If jack rafters are placed 12" on centers then line Bb is length of common rafter per foot of run. If 16" on centers then Bb is one and one-third times the length of common rafter per foot of run. Many carpenters use the following rule for finding the length of jack rafters. Divide length of the common rafter into one more equal parts than there are jacks. One of these spaces is length of shortest jack, two of them the second jack, etc.

Figure 6 (not original with author of this article) is a common way of representing graphically the lengths and cuts of rafters. The lower left hand side showing a hip, two jacks and a common rafter laid down flat thus indicating true lengths of each and side cut of jacks, also how to apply square to make side cut. The right hand side gives the lengths and cuts for hip or valley rafter. The side cut of hip or valley is usually made before the backing is done. When this is the case the carpenter uses length of hip on tongue and run of hip on blade and marks on tongue to secure the side cut. The drawing illustrates a right angle triangle, DEF, having one side equal to run of hip and another equal to length of hip. A row of figures on the square gives numbers to use for the side cuts. Fig. 9 gives a method of finding these cuts. If backing is put on rafter before side cuts are made then side cut is the same as for the jack rafters.

Figure 7 shows backing of hips and valleys. Figures 1 and 2 give position of hip and valley when unbacked. When the hip is unbacked it is dropped a vertical distance "D". Two methods of backing with square are indicated.

Figure 8. Hips, valleys, and sometimes jacks have a measuring line along the middle of the back or upper edge which must be considered when making side cuts. There is also a measuring line along the side when rafters are framed like Fig. 4B. The measuring line on side of hips and valleys should be the same—measured vertically—as for the common rafter. The letter "V" in Fig. 8 gives vertical distance from upper edge of common rafter to measuring line which should be the same distance from top of ridge on a backed hip, or unbacked valley and from bottom of groove on a backed valley. An unbacked hip must be treated as explained in Fig. 7. A common mistake made is to draw the measuring line the same parallel distance from upper edge of hips and valleys as on common. The result obtained is seen on the right hand portion of Fig. 8. The hip or valley is dropped a distance equal to "D" too much.



ROOF LAID OUT BY STUDENTS IN STUDY OF ROOF FRAMING.

Figure 9 illustrates a method of obtaining side cuts of valleys, hips, and jack rafters for a square cornered building. This same method may be used to find side cuts for buildings not having square corners or even pitches but the distance to square back from plumb cut will not be equal to thickness of rafter as in this case.

Figure 10. The sheathing boards on a hipped roof forms an inverted hopper. A glance at Figures 5 and 6 will show that the cut across face of board may be obtained by cutting on opposite part of square from that used for jack rafter. Also given on framing square. Fig. 5 shows that angle A must be more than a 45° angle. Left hand side of Fig. 10 shows miter cut across the edge of board. These cuts may also be obtained in a miter box by inclining the board at the same angle it will occupy on the roof and setting the miter box saw at a 45° angle. Wooden miter boxes are also made for the same purpose, making angle across the top that for the face of the board and down the sides that for edge of sheathing board.

# Parchmentized-Cloth Light Shades

Bertha G. Morey.

AS no amount of careful direction will quite meet all the things that actual experience will teach it is best to use for the first problem something small like a candle shield, candle shade or small lamp shade.

For parchmentized-cloth shades the machine made frames must always be used as it is impossible to make frames by hand of heavy enough wire to be strong enough to stand the tightly stretched covering.

Fine or coarse linens, silks and cottons are used for the material to be parchmentized. For a texture almost like glass fine china silk is used. For a texture a little less like glass crepe de chine, georgette, fine linen or fine cheese cloth will make an interesting quality for most purposes. Very coarsely woven materials that have light holes between the threads make very stunning shades that are to be used in club rooms or hallways. For this character of shade use pongee, grass cloth, linen, light-weight, unbleached muslin or coarse cheese cloth. The coarse materials will not be found as flexible or easily worked as the crepe weaves of finer materials. For all purposes the white or natural colored materials are the best to use. The white can be treated with any color and the natural colored materials can become a part of the color scheme. Very charming shades can also be made by using the colored or figured materials as the parchmetizing treatment makes the material more or less transparent. It is frequently necessary when using the figured materials to intensify some parts of the design where the color is too weak. This can be done using the transparent oil colors. To determine whether or not a color is transparent paint a stroke on glass and if the light shines through the paint will be suitable to use. Very often very thin coats of paint will be transparent and a heavy coat very opaque. This is true of the vermillions and some of the oranges and yellows. As the different makes of color differ in transparency tests should be made. The photographic oil paints used for tinting photographs are transparent, very brilliant and the best for this work.

The simpler designs of heavy wire shade frames are the most successful shapes for the glazed or parchmentized cloth shade. The top and bottom wires should be wrapped with white taffeta seam binding.

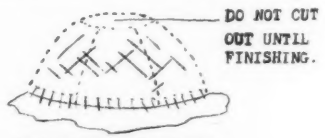
To cover the frame stretch the material if possible without seams over the frame and sew with coarse thread with a close over and over stitch to both the top and bottom wires. If seams are necessary arrange the seam along a coarse rib wire. Do not trim off the edge of the material until the shade is ready to finish as the handling during the different processes would make a weak seam give away. The material should go over the frame without wrinkles but if there is a small place that will not smooth out, dampen with water, and the shrinkage when drying will smooth out the surface.

When the material is no longer damp from the water, paint over both sides of the material with a mixture of one part white damar varnish to six parts of clean turpentine. Then immediately while the shade is very wet, paint over both sides with clear white damar and allow to dry, which usually takes a day or so. A second coat of clear damar must be applied to give the glazed appearance. On very heavy material a third or fourth coat may be needed. Never use shellac in this work as it is very brittle when dry and becomes opaque in a short time.

Owing to the delicate surface the design should be drawn in freehand. If this is not possible the transfer paper must be used as lightly as possible. Any undue pressure against the fabric may stretch the surface into a loose place.

Tube transparent oil colors must be used if transparency is desired. Some workers purposely use some opaque colors if the design is made to allow for the effect. Use red sable brushes suitable for the size of the spaces to be painted. To thin the color to the proper consistency for painting use a mixture of one-half turpentine and one-half linseed oil. While painting, hold the shade up to the light to see the strength of the color. If the color is to be very brilliant several applications of the paint will be necessary. The color must dry between each painting. Any undesirable brush marks may be removed while the paint is still wet by stippling or pouncing with a small piece of cotton covered with two thicknesses of laundered china silk. New silk will not give a pleasing surface.

A GOOD TYPE OF FRAME FOR THE PARCHMENTIZED TREATMENT.




SHOWING METHOD OF USEING PINS TO HOLD MATERIAL IN PLACE FOR SEWING.

When the design is perfectly dry which will be in ten days or more give the whole shade a coat both inside and out of white damar varnish and when perfectly dry trim off the seams and cover the edges with a finishing braid. This finishing braid may be gold braid, velvet ribbon, plain black braid, fancy braid or the socalled moss braid which is a long napped plush or velvet material.

A word as to the choice of designs may be in order. The present trend of the foreign lampshade maker as shown by the Studio year book is to be the undecorated shade of very beautiful shape. This shape is accented by the finish binding. A few of this style of shade is always shown and is very beautiful of parchmentized material of suitable texture for the place where the shade is to be used.

However, all sorts of shades are used, and each interior has some special need be it for a very gay or a very plain lamp. A lamp may be a most decorative and brilliant piece of furniture and almost take the place of very gorgeous flowers.

# PROBLEMS AND PROJECTS

*The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.*

*Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.*

*Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.*

## OLD ENGLISH FURNITURE AND TABLE LAMP.

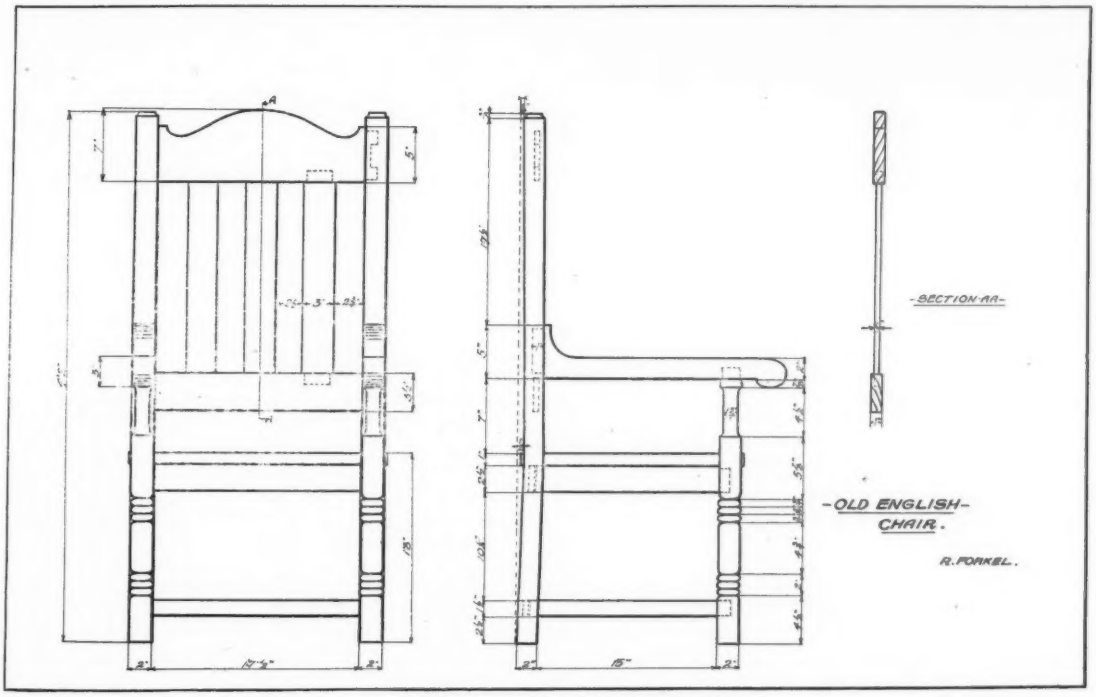
**Reinhold Forkel, Instructor School of Industrial Arts, Trenton, N. J.**

The lover of Old English furniture should appreciate this set of furniture and hexagonal table lamp designed and executed by the students of the woodworking department of the Trenton School of Industrial Arts. The set expresses the very fine feeling of the period. The simple style of construction and the fine carving on the legs of these pieces add greatly to the beauty of the finished work. The set of furniture is constructed of quartered white oak, with fumed oak finish.

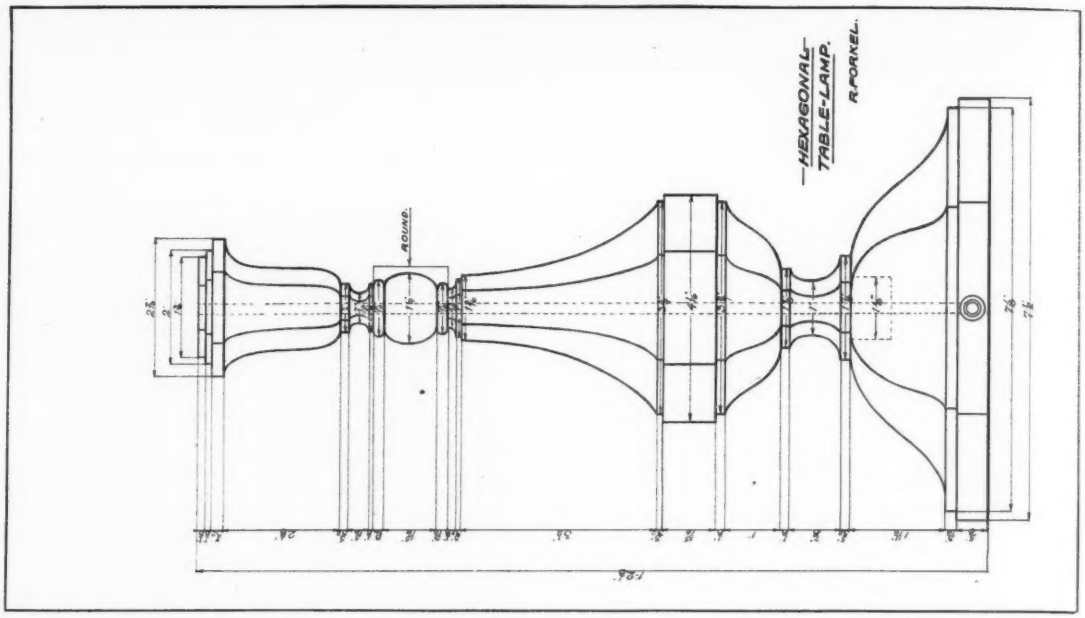
The hexagonal table lamp is a fine example of craftsmanship. The fine outline work and the excellent finish add greatly to the beauty of the lamp. The construction is in two parts and offers an excellent problem for lathe practice and pattern making. The finish is accomplished in dark gold, with the high spots in leaf gold.

In the construction of these several pieces, the wood working department was given every possible assistance for producing the best work. The students with the help of the instructor made the preliminary sketches and working drawings of the proposed pieces. Many of the designs were new ideas or creations worked out by the members of the class, which helped considerably in bringing new life and interest into the work. Special attention was given to the matters of design, proportion, construction, finish and general utility of the pieces constructed.

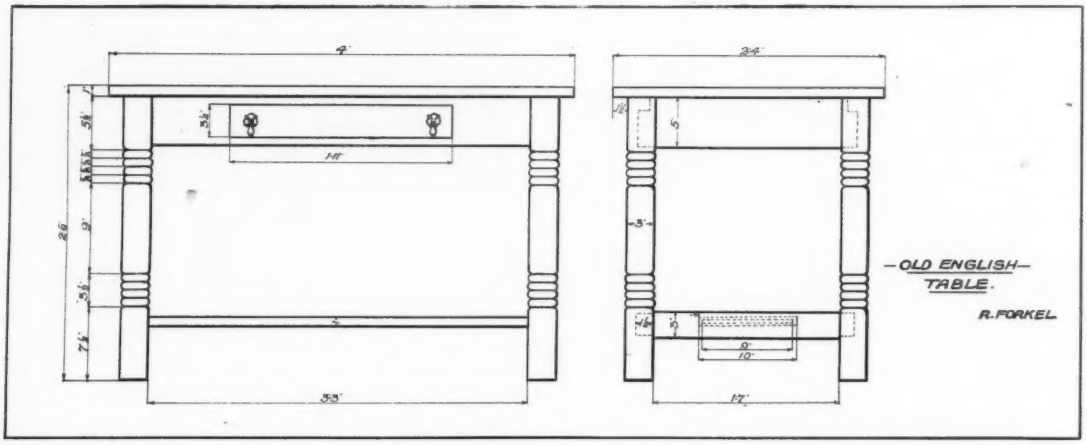
OLD ENGLISH FURNITURE REPRODUCED BY STUDENTS.



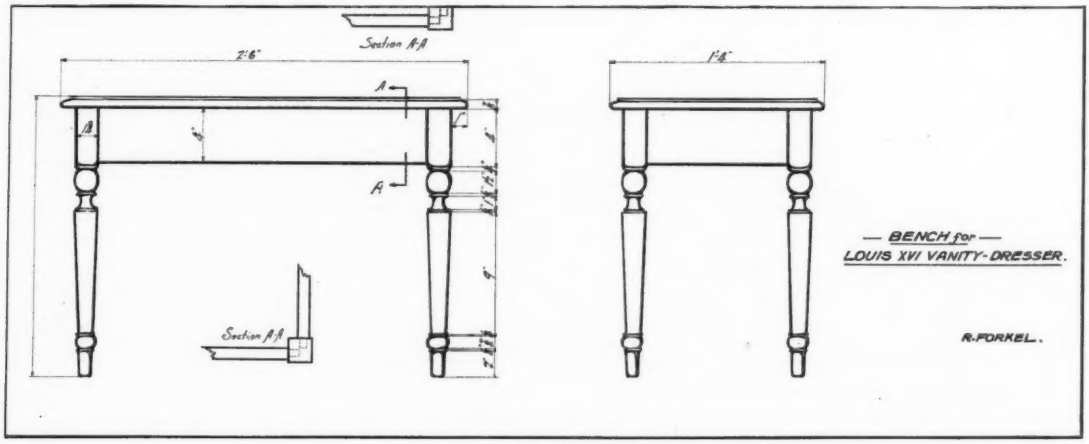

DETAILS OF AN OLD ENGLISH CHAIR.



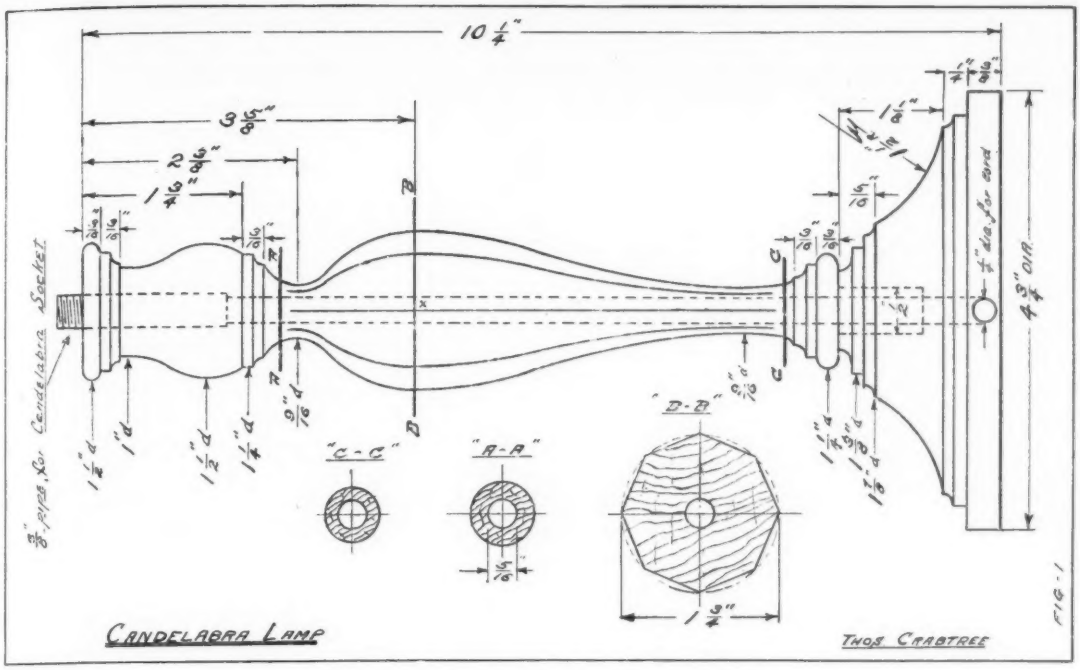

DETAILS OF A TABLE LAMP.




DETAILS OF OLD ENGLISH TABLE.




DETAILS OF A BENCH.



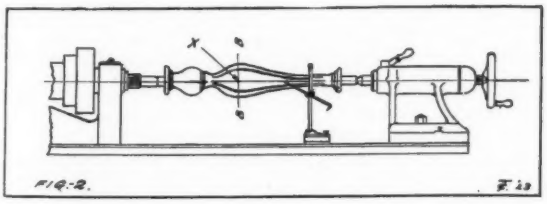

DETAILS OF AN OCTAGONAL CANDELABRA LAMP.

## CANDELABRA LAMPS.

**Thos. Crabtree, Normal School, Oswego, N. Y.**

The candelabra lamps afford an interesting problem in fine wood-turning, involving both spindle and chuck work. The shaped sides bring in a simple, yet attractive, design of wood carving which can be worked out by anyone adapted to the use of the wood paring chisel.

The socket used is of the candelabra type, either snap, pull chain, or push button, (Bryant). This necessitates the use of a 110V. lamp with a candelabra base. The regular (standard) light socket may also be used if it is inconvenient to procure the smaller type. The bulb should




be of the round type, to better support the shade, otherwise a fixture will have to be employed.

The method of procedure is the same as in any other type of lamp, the hole for the cord being bored before any turning is done on the spindle. A turned plug, to fit the hole, will relocate the centers ready for turning. The body of the spindle should be turned to the largest diameter as shown in section "B-B". After all turning is done and the work sanded, the section line "B-B", is marked with a pencil while the lathe is in motion. This is the first step in the layout of the sides.

The circumference is then divided into eight equal parts, using dividers, which determines the width of the sides. Mark the spindle as to its location in the spur center, and remove it from the lathe. This mark tallied up with the one on the spur, will always locate the work again in its proper position. Remove the rest from the lathe bed, and adjust the point, of the arm, of the surface gauge to the center line of the lathe at dead center, the base of the gauge resting on the bed of the lathe. It is very important that the gauge be set to the exact center, for if it is higher or lower, a true center line will not be scribed on the work.

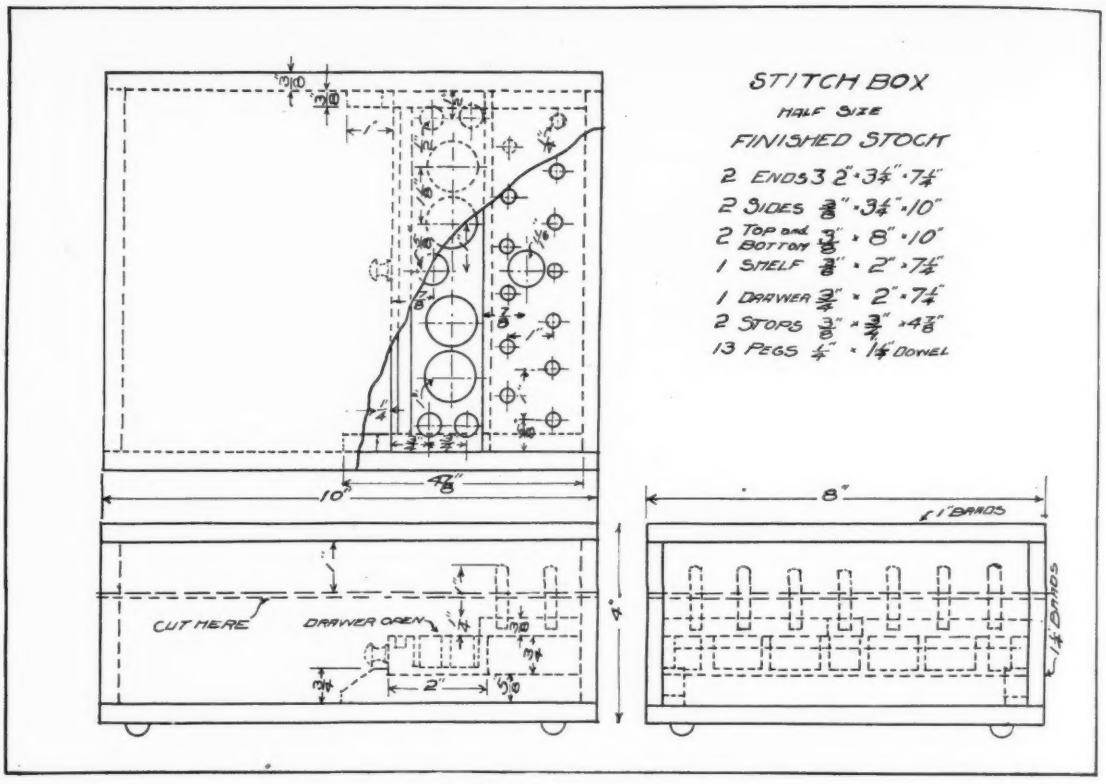
Replace the work between centers, and turn around until point, x, on section line "B-B" (Fig. 2), coincides with the point of the gauge. Scribe this line on spindle between sections "A-A" and "C-C" (Fig. 1). Repeat this operation until the eight sides are completed. With the chisel, remove the stock between these lines, taking care not to cut below them or a wide side will result. Where the sides blend into the diameters at "A-A" and "C-C", a sloyd or pocket knife can be used to a great advantage.

After sanding, and gluing the spindle into the base, the lamps should be stained, filled, and finished with one or two coats of orange shellac and two of rubbing varnish. Rub the last coat of varnish with rotten stone and crude oil. This produces a soft, satin finish, which is in keeping with the delicacy of the design. No rubbing or sanding should be done with oil, between coats, as this prevents one coat from adhering to another. The wood used should be of some high grade cabinet wood, such as mahogany or black walnut, that is not too hard to pare with the chisel. Cherry, beech or gum also work up well and take a beautiful mahogany finish.

## SOMETHING FOR MOTHER.

**M. J. Hughes, Seattle, Wash.**

In every elementary school shop there comes once a year a strong desire, on the part of every boy, to make something for his mother. If this desire is properly directed there is no measuring the good that can come from a successfully finished, appropriate project; but, too often the project results only in disappointment for all concerned. That which will give the bby a realization of a useful thing well done and the mother many happy hours showing her gift to her friends is the problem to be met in the choice of a project.




DETAILS OF A "STITCH BOX."

The accompanying drawing suggests such an article which has been used for several years and found to appeal to most boys; few fail at it and every mother is delighted with it. It has been called a "Stitch Box." In it is kept an assortment of buttons, thread, needles, pins and may contain embroidery, darning or handwork.

THE BOX READY FOR USE.

The box pictured is made of ⅜" red gum. The sides and ends butted, glued and nailed with 1¼" brads. The top and bottom glued and nailed with 1 inch brads; the outer corners are rounded and the outside is shellaced and polished. The spool shelf should be put in before nailing on the cover but the cover should be cut off after the outside has been polished.

The drawer is made of ¾" gum with an assortment of holes bored nearly through for button containers. The center holes corresponds to one just above in the spool shelf and is used to hold the thimble, which locks the drawer when a spool is placed on the center peg and the lid closed. The slot in front of the drawer is made with a ¼" gouge or chisel and contains large needles or crochet hooks. Spool pegs are made of ¼" maple dowel cut by rolling under a knife edge.

With dimensions as given the drawer may be lifted out but will not slip out unless the box is upset. However, inaccuracy in fitting does not necessarily affect the usefulness of the drawer.

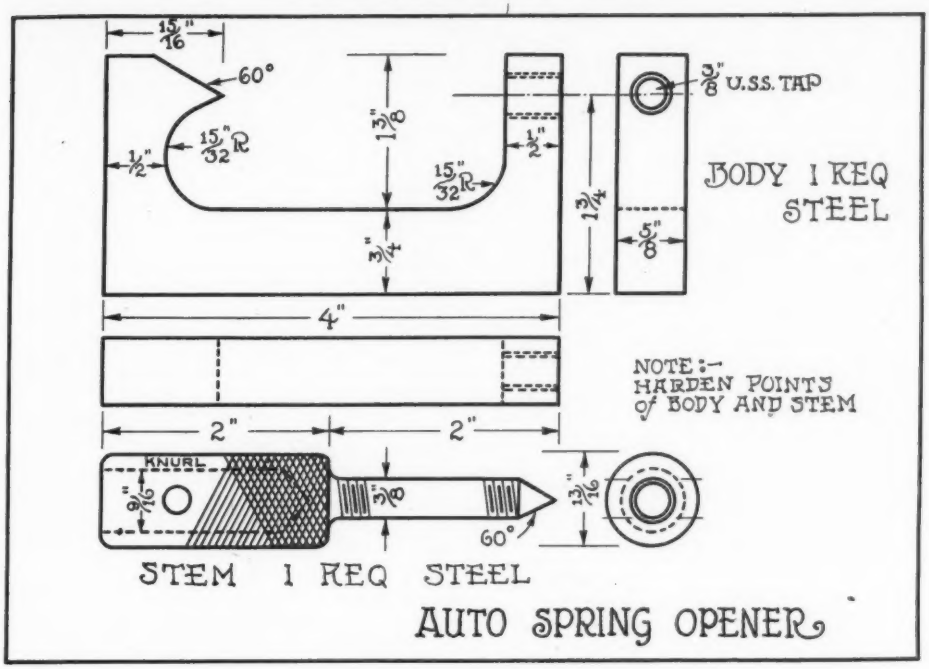
A pin-cushion made over a cardboard cut to fit the lid is in just the right position when the lid is open. The lid is fastened with small strap hinges and the box rests on four rubber buttons which prevent its being pushed off the table.

## EFFECTIVE GRASS PROTECTION.

**Victor J. Smith, Professor of Manual Arts, Alpine, Tex.**

No doubt many school yards are disfigured by "cross cuts" and other thoughtless or unnecessary damage which makes well developed grass plots on the campus impossible. The mute appeal illustrated in the accompanying cut has

EFFECTIVE AND POLITE.




DETAILS OF A SPRING OPENER.

been used by a number of schools with far better results than the gruff "keep off the grass" signs.

As a project in woodworking it may serve equally well as a piece of benchwork, in lieu of the oft used coat rack, or as a routed project (put out in multiple) which is intended to introduce the beginner to the adjustment and operation of woodworking machines. Some further possibilities lie, of course, in the stenciling and in the painting to meet outside weather conditions.

### CONSTRUCTION OF AN AUTOMOBILE SPRING OPENER.

**Thomas Aykroyd, Hyde Park High School, Boston, Mass.**

This tool is very handy about an automobile. Its aid in lubricating the springs, suggests a good productive exercise in machine shop work.

The body and stem may be made of tool or machine steel. Whatever material is used, it should be hardened or tempered to the proper harness, (60° points.)

Below are given the operations:

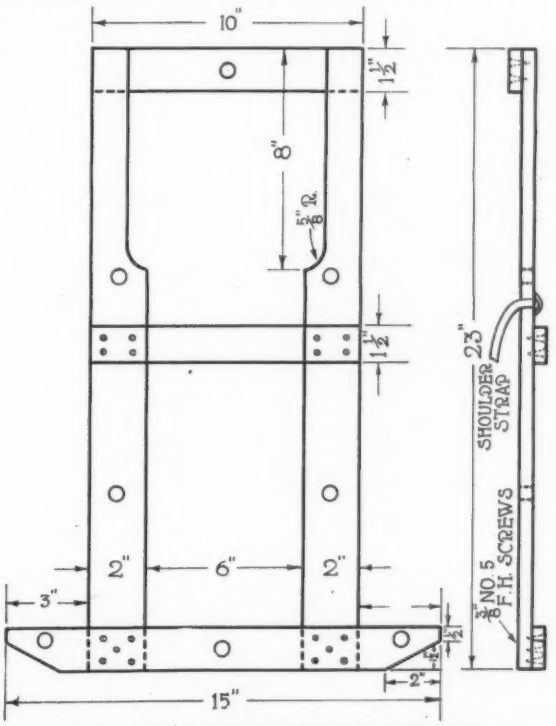
| Operation. | Machine. |
|---|---|
| Sides and ends. | Planer or Miller. |
| Layout holes. | Bench. |
| Drill holes. | Drill. |
| Cut out piece. | Miller. |
| File and tap. | Bench. |
| Harden. | Forge. |
| **Stem.** | |
| Cut Stock 4½" long. | Power Saw. |
| Center and face ends. | Lathe. |
| Rough turn and knurl. | Lathe. |
| Finish turn thread end. | Lathe. |
| Cut thread. | Lathe. |
| Cut 60° angle on point. | Lathe. |
| Drill handle. | Lathe or Drill. |
| File and polish. | Lathe. |
| Harden. | Forge. |

### PACK SADDLE.

**Floyd J. Smith, Miles City, Mont.**

This model is very popular with boy scouts; in fact it is a real live problem for any boy who loves the great outdoors. Straight-grain, quarter-inch oak or maple will do fine for the wood.

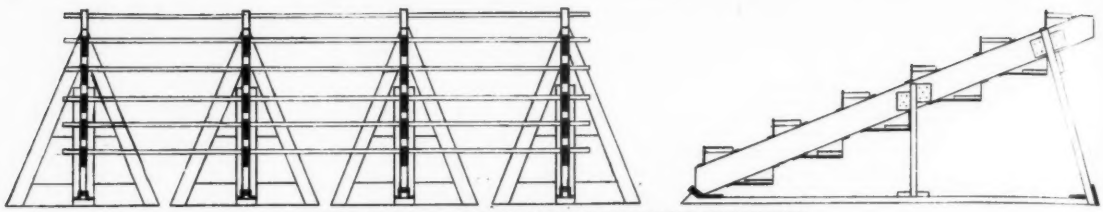
The drawing itself is self-explanatory. The crosspiece at the top is fastened to that part of the saddle which is to fit against the back. The other two crosspieces are fastened to the outside. The several drilled holes are for the strapping of the pack itself onto the saddle. Here an avenue is opened up to each instructor to teach methods of wrapping and stringing packs for a hiking trip.




DETAILS OF A PACK SADDLE FOR SCOUT USE.

Two strips of strong soft leather 18" long and two strips of sheep skin the same length and about a half inch wider are used for the shoulder straps. These are riveted to the saddle and at the other end, a very strong cord is

PORTABLE TAKEDOWN BLEACHERS



FRONT AND SIDE ELEVATIONS OF PORTABLE BLEACHERS.

knotted and strung through the leather and sheep skin, then down to the cross brace at the bottom of the saddle. This scheme makes the pack saddle adjustable so that a man six feet in height or a boy much smaller may each carry the pack with a maximum amount of ease. We put a natural wood finish on all our pack saddles.

### PORTABLE TAKE-DOWN BLEACHERS.

**Emery Smith, Three Rivers, Mich.**

The portable take-down bleacher offers a fine project for a manual training and forge shop class. If there isn't a forge shop class, the irons can be bent by a local blacksmith at a small cost. It is a project that can be easily handled by a junior high school class and only a few tools are required.

The material is all dimension yellow pine and can be purchased at any local lumber yard. The iron work is all 5/16"x1¼". The irons are fastened to the woodwork by No. 10—1½" flat head wood screws. The holes are drilled ¼" and countersunk. The bleachers when finished with two coats of green or gray paint form a very valuable addition to any high school. They can be used outdoors for baseball, football, or track and indoors in the gymnasium for any indoor events. When not in use they can be taken down and stored in a very small space. They can easily be worked out in any size to fit any requirements.

**List of Parts.**

1. Seat Support Stringer—4 required.
2. Stringer Brace—4 required.
3. Floor Rest—4 required.
4. Stringer Brace—4 required.
5. Seat Board—6 required.
6. Foot Rest Board—5 required.
7. Seat Support Iron—24 required.
8. Foot Rest Iron—20 required.
9. Stringer Iron—4 required.
10. Stringer Brace Iron—4 required.
11. Stay Blocks—40 required.
12. Stringer Tie—3 required. See detail sheeet.

**Specifications.**

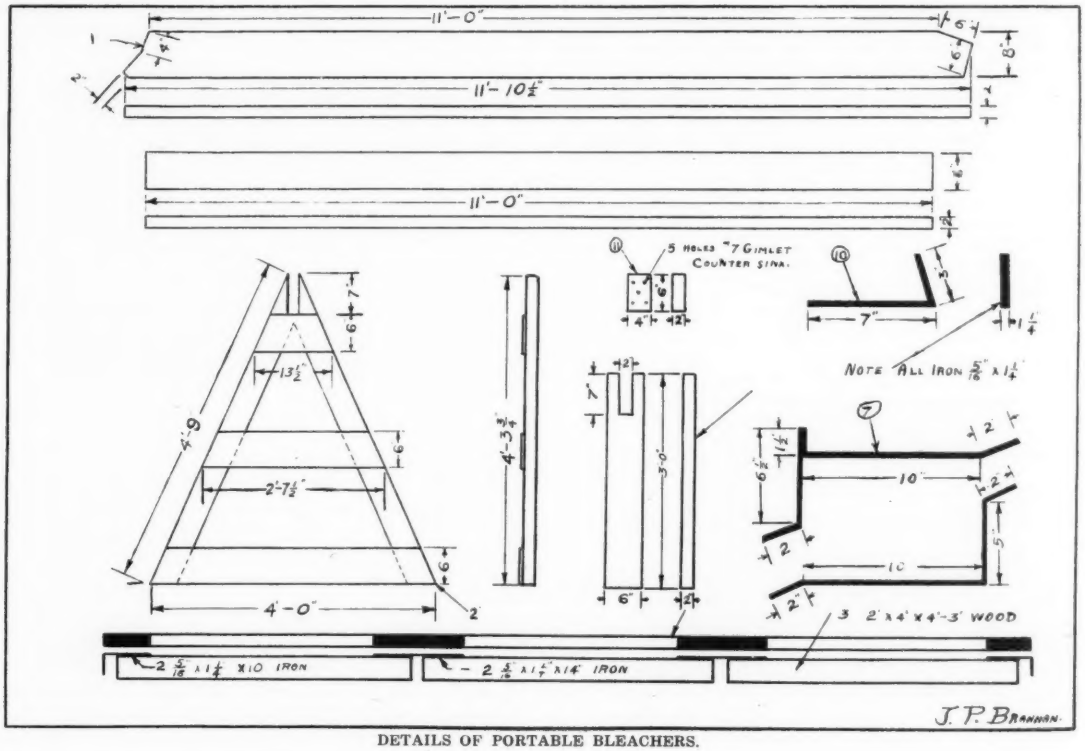
| Tiers | Height | Width | Capacity per section |
|---|---|---|---|
| 3 | 2'-7" | 5'-0" | 20 |
| 4 | 3'-5" | 7'-0" | 40 |
| 5 | 4'-0" | 9'-5½" | 50 |
| 6 | 4'-6" | 11'-0" | 60 |
| 8 | 5'-9" | 14'-4" | 80 |

Standard length 14'-0".

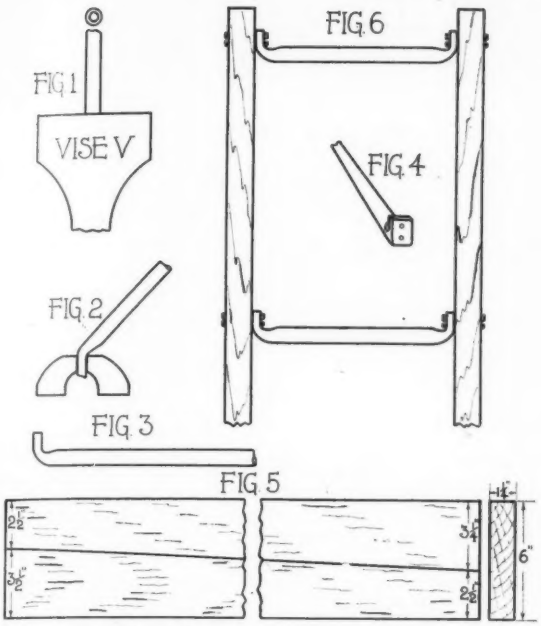
### A NEW LADDER CONSTRUCTION.

**M. L. Brooks, Columbus, Kansas.**

Every building, or shop, should have one or more good ladders as a part of its regular equipment. For




DETAILS OF PORTABLE BLEACHERS.




DETAIL FOR LADDER MAKING

strength and durability, the following makes the best ladder we have ever used, and the material can be purchased in any town.

For the rungs use ½" gas pipe cut to the length to make the ladder the width you desire. Heat ends of pipe red hot for two inches, clamp in vise as shown in Fig. 1; tighten vise gradually as you bend as in Fig. 2; as pipe is bent at right angle, Fig. 3, drill two ¼" holes in each end, Fig. 4.

The rails of the ladder may be made of any good light wood. Cypress is probably the best on account of strength, lightness and durability. Fig. 5 shows a good way to cut board.

We use 1¼" by 6" up to sixteen feet long. Longer ladders should use thicker wood. Place rungs twelve to fourteen inches apart and bolt or rivet in place.

### A PROJECTION BOX.

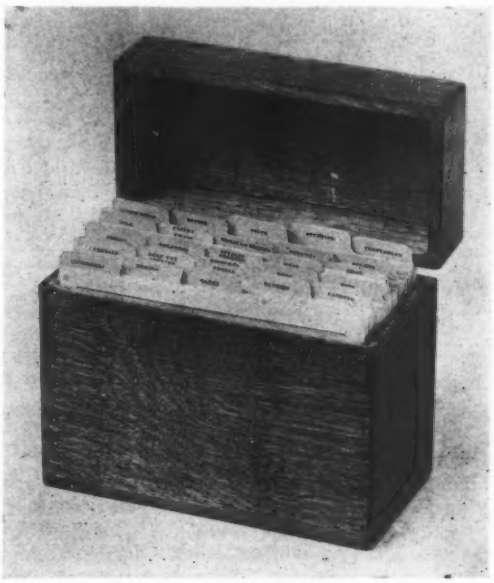
**C. L. Conroy, Manitowoc, Wis.**

The accompanying drawing is complete and describes in detail the arrangement of the making of this projection box. The box has been used very successfully in the writer's classes.

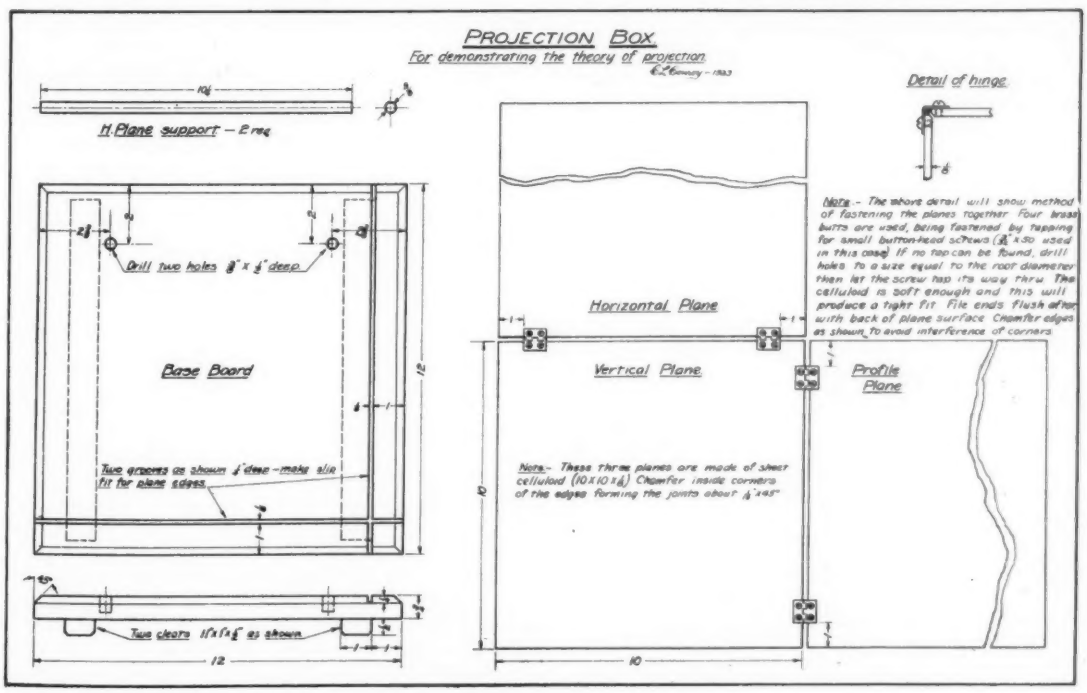
### A FILING CABINET FOR THE COOKING DEPARTMENT.

**F. W. Ziegenhagen, Milwaukee, Wis.**

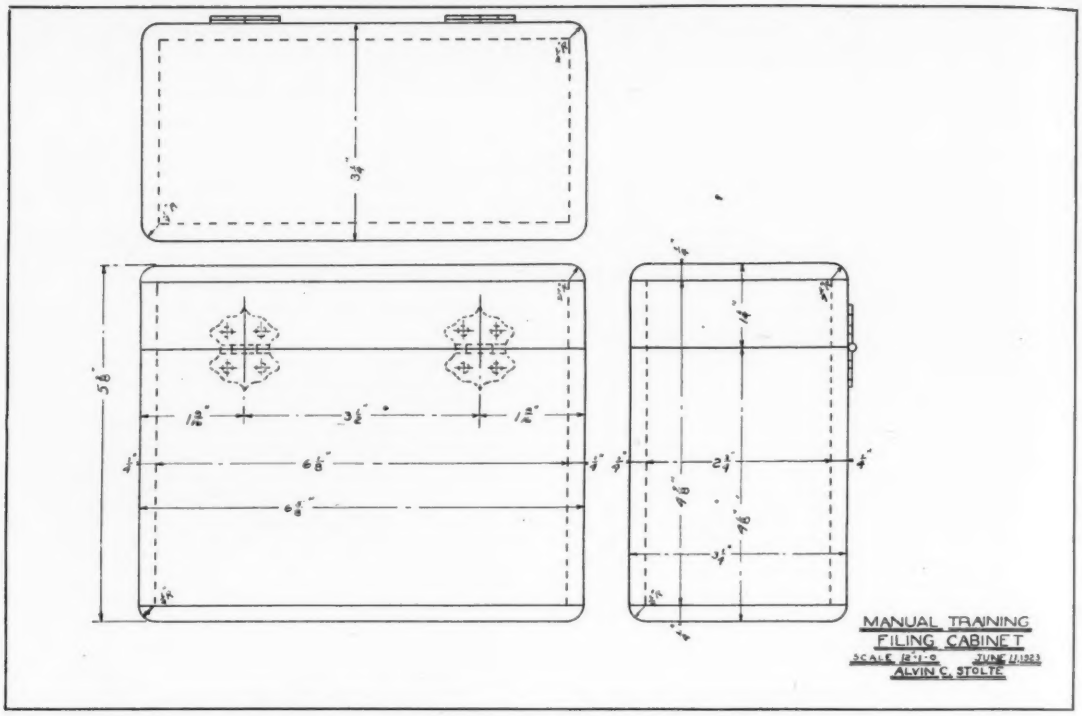
The filing cabinet shown in the above drawing is one that can be used for various kinds of record keeping. The



THE CABINET IN USE.


PROJECTION BOX
For demonstrating the theory of projection
H. Plane support — 2 req
Detail of hinge
Drill two holes ⅜" x ¼" deep
Base Board
Two grooves as shown ¼" deep — make a fit for plane edges
Two cleats 1"x1½"x⅝" as shown
12
Horizontal Plane
Vertical Plane
Profile Plane
Note:- These three planes are made of sheet celluloid (10 x 10 x ⅛) Chamfer inside corners of the edges forming the joints about ¼" x 45°
10
Note - The above detail will show method of fastening the planes together. Four brass butts are used, being fastened by tapping for small button-head screws (⅛" x 30 used in this case) If no tap can be found, drill holes to a size equal to the root diameter then let the screw tap its way thru. The celluloid is soft enough and this will produce a tight fit. File ends flush after with back of plane surface. Chamfer edges as shown to avoid interference of corners.

DETAILS OF A PROJECTION BOX.

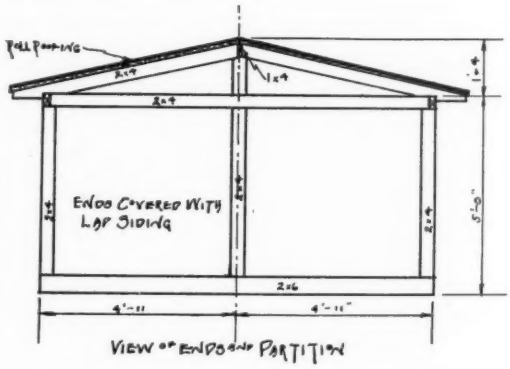


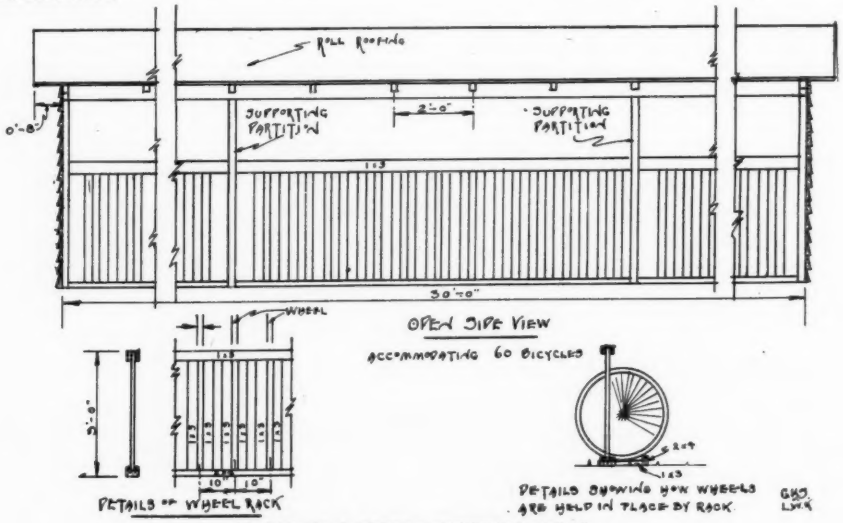

DETAILS OF A FILING BOX FOR THE COOKING DEPARTMENT.

cabinet can be made in schools where manual training is taught and where short pieces of material are left over from larger projects.

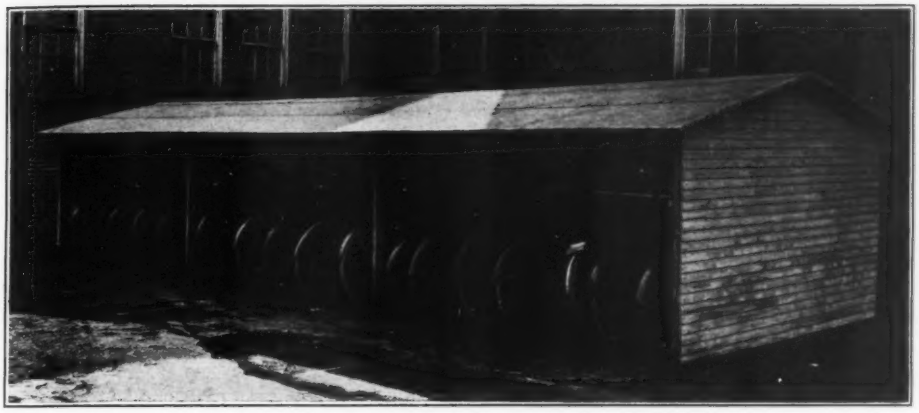
The project may be constructed either in a butt, tongue and groove, or dovetail joint. The box may be built up to the entire height, namely, 4⅞", then the edges of the box planed free from wind. Next the top and bottom should be glued on. After the box is assembled it should be planed, scraped, corners rounded, and sandpapered. Then the cover part of the box may be cut, either straight on the rip saw as shown in the drawing, or the joint may be cut circular on the band saw.

The cut joints should be straightened if necessary, the box cleaned free from glue on the inside, and the hinges attached as shown in the drawing. The box should be stained to match furniture.




PLANS OF A SCHOOL BICYCLE GARAGE.



THE GARAGE IN USE ON THE SCHOOL GROUNDS.

## A BICYCLE GARAGE.

L. W. Kunkle, Greenville, Pa.

In many of our high schools, especially where a large number of the boys ride bicycles to and from school, there is not ample room provided for the proper care and protection of the many bicycles. The accompanying drawings show how the situation was met at the Penn High School, Greenville, Pa.

During fair and suitable weather seventy-five is about the average number of bicycles to be taken care of daily. The bicycle garage was built by the sophomore boys under the direction of the woodwork instructor. The approximate cost, including lumber, roofing, nails and painting was $67.

## SPECIAL MANUAL TRAINING WORK IN LOS ANGELES.

The Los Angeles board of education has recently opened two centers for manual training in which rather novel forms of work have been developed under the direction of Mr. Charles A. Kunou. The work has been housed in special shop buildings located on the grounds adjoining the school buildings proper and the work is in charge of two teachers in each case.

The buildings are one-story high and have been especially designed and equipped to carry on six types of prevocational work as follows:

1. Painting and finishing.
2. Gilding, bronzing, silvering, composition work, including work in magnesite materials.
3. Art cabinet work.
4. Practical leather work, including shoe repair.
5. Plaster paris, clay, and cement work (ceramic work).
6. Repairs and chores for home and school needs, including soldering, occasional electric wiring and sheet metal work.

The buildings each measure 24x54 feet, are one-story high and are not plastered. The roof is so framed and elevated as to give ample air volume and to permit complete ventilation and a cool interior on hot days. The buildings accommodate 35 pupils at a time and four distinct activities are carried on at once. Each building is provided with gas for heating purposes and a heating process and with electric current for lighting and for the operation of small motors.

Pupils belonging to the regular classes in the schools are instructed in these rooms and some talented pupils who seem to have some special aptitudes in the various kinds of work offered are drawn from the various schools adjoining and form special classes for advanced work. This latter arrangement is a departure from the practices in vogue in manual training and pre-vocational work. The underlying intention is that this latter class of pupils will develop qualities and aptitudes which may result in the development of designers and leaders in mechanical lines of work. The selection of the so-called talented pupils includes the principle of self-finding and self-guidance of the vocational kind.

Each group of work offered in these special centers may be called a craft. The things contemplated and now being made form a large part of a very extensive business and manufacture.

*Scientific definition.* The right idea of handwork (manual training) includes the following elements, viz:

Use value .....
Art value .....
Vocational value .....
Avocational value ....
Commercial value ....
} = Educational Value.

Any exercise, model, project, or thing, which, when analyzed, possesses these values, is educational.

The educational value is the real, and highest good, in all school activities; because it is the all-inclusive and the final. To base handwork activities in the schools upon repairs or chores exclusively, or upon any feature which, when put to the scientific test, is found not to possess all these values, is fallacious. There is the truth about this work, and human beliefs and opinions are not always elements of truth.

### Synopsis of Activities.

The following synopsis outlines the main activities to be undertaken under the heading of eight crafts taught in these two centers:

1. *Box craft.* The making of all kinds of boxes, singly, by the dozen, or by the hundred, using jigs and various other contrivances for the cutting up of stock and the rapid assembling processes, mass-smoothing and mass-sanding of materials, boxes to be such as vanity boxes, jewelry boxes, knife-and-fork boxes, stationery boxes, file-card boxes, and toy banks, ditty boxes, and the like, which, when finished, can be sold.

2. *Notion and fixture craft.* The making of all kinds of candle holders, window display fixtures, such as "T" stands, shoe tippers, hat stands, collar stands, book ends, door stops, and other notion articles, such as decorative coat hangers, decorative flower and garden stakes, all of marketable quality.

3. *Furniture craft.* The making of various kinds of small useful and ornamental pieces of furniture, such as: stools, and chairs, with upholstered and woven tops. The

making of various clock cases, fancy taborets, pedestals, tie racks, etc., all of marketable quality.

4. *Lantern craft.* The making of all sorts of lanterns, such as: decorative paper lanterns, wood lanterns, sheet metal lanterns, papier mache lanterns, newel-post and porch lanterns, all of marketable quality. The lanterns afford great opportunities in design, construction, finish, and use. It includes the handling and coloring of silk, paper, and other transparent materials for obtaining beautiful lighting effects.

5. *Leather craft.* The making of belts, pocket-books, coin purses, music rolls, portfolios, vanity cases, all of marketable quality, and constructed in artificial and higher classes of material. This craft includes shoe-mending and other leather repairs. This craft also includes work on machinery as well as hand work.

6. *Picture frame craft.* The making of all kinds of picture frames from the cutting out of the same in a single piece, to the most complex-membered classes of picture frame moldings.

7. *Tile craft.* The making and casting of various kinds of plaster paris plaques for ornamental purposes, and colored polychromatically or otherwise. The making and casting of colored cement tiles, toys, and cement pottery, including the use of various magnesite materials.

8. *Toy craft.* The making and coloring of all kinds of toys, such as: toys in wood, stationary toys, moving toys, mechanical toys, etc., all of marketable quality. This class of objects is almost limitless in its scope.

9. *Chores and repairs.* In this group is provided opportunity and material for various kinds of chores for school and home. When absolute need exists.

The synopsis includes miniature modern processes of handling and treating materials, of laying out construction and assembling processes, individual and en masse. It includes the handling of the various finishing materials, such as: stain and stain making, shellacing and varnishing processes, the obtaining of gloss and reducing of gloss to mat effects; the painting and enamelling processes, including priming and enamelling coating, colored enamelling. It includes the gilding, bronzing, and silvering processes on wood, metal, and plaster paris objects. Including further the study of materials used in actual modern processes of this nature; the mixing, and making of these materials and combinations. It includes the making of ornaments of composition, the attaching and coloring of these upon the objects. Further, it includes the study of color, mixtures and proportions. It also includes the mensuration and computation of amount and cost of materials. It also includes the study of these materials, their manufacture, composition, current quotations, market opportunities, manufacture and labor opportunities, the study of various commodities, their scarcity or abundance in the market. It includes the making of specification drawings and designs. It includes individual work, group work, mass construction.

*Note*—An outline of the gilding and bronzing work will appear in an early issue of the INDUSTRIAL ARTS MAGAZINE.

## TRADE, CRAFT OR PROFESSION?

In defining the teaching of printing, the Printing Instructor for June discusses the relative difference between a trade, a craft, a business, and a profession as follows:

"The term *trade* applies particularly to the mechanical occupations. *Craft* is often interchangeable with trade, but is used in a broader and nobler sense. It implies possession of wider range of skill and versatility and more of native aptitude or dexterity. We speak of the trade of the carpenter or the compositor, but the craft of the woodworker or printer. A *business* is an occupation of a mercantile or commercial nature, that is, connected with buying or selling. The term *profession* designates a more learned calling or vocation. The ancient learned professions, as recognized and fostered in the medieval schools and universities, were theology, law, and medicine. In modern times this list has been considerably extended, and we now recognize sculpture, art, drama, engineering, and teaching as professions of equal rank and dignity with the three original ones. If teaching is regarded as a profession, then every teacher, including teachers of printing, should appreciate the full significance of the term "profession" in order to live up to it. It is distinguished from the other terms—trade, craft, and business—as follows:

"1. It signifies a deliberate choice of, and exclusive devotion to, a specific career.

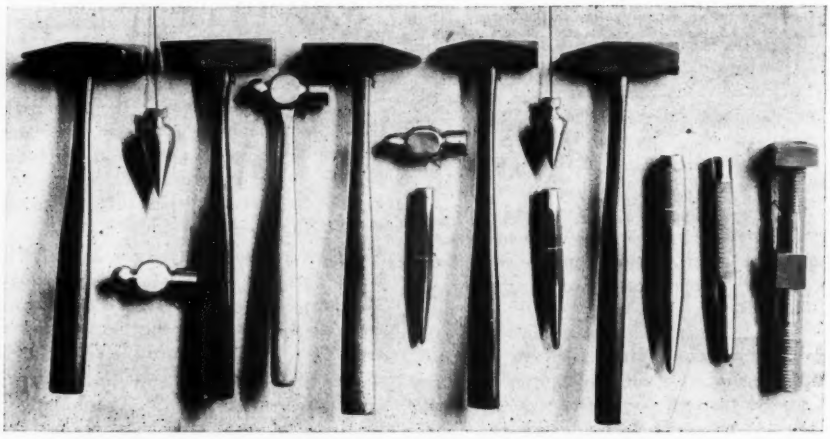
"2. It requires a long, unproductive period for preparation.

"3. It involves the idea of special personal service to mankind as distinguished from the private gain idea of business careers.

"4. It requires superior endowment of native intelligence.

"5. It sets up rigid standards for entrance.

"6. It prescribes certain restrictions and regulations for practice."



HAMMERS, PLUMB BOBS, PUNCHES, ETC., MADE IN BISBEE, ARIZ., HIGH SCHOOL.

## PROGRAM FOR SCHOOLS OFFERING APPROVED COURSES IN ART IN THE JUNIOR HIGH SCHOOL GRADES.

Leon Loyal Winslow, Albany, N. Y.

### I—Motivation and Background.

I. Art in nature
II. Art in industry (Manufacturing)
- Printing
  - Books, magazines and newspapers
- Ceramics
  - Pottery including art ware, dinner ware and hotel ware
  - Terra cotta
  - Brick and tile
- Costumes
  - Waists, dresses, suits and cloaks, negligees, children's dresses
  - Millinery
  - Jewelry
- Furniture
- Lighting fixtures
- Machinery
- Printing
- Silverware
- Textiles
  - Printed patterns
  - Woven patterns
- Wall paper

III. Art in building and furnishing (construction and arrangement)
- Architecture, including architectural ornament
- Interior decoration

IV. Art in commerce (advertising and distribution)
- Written and typewritten work
- Lettering
- Illustration

V. Art in painting
VI. Art in sculpture

### II—Essentials of Design

I. The origin of design
II. Three governing aesthetic principles
- (a) Rhythm
  - Simple repetition
  - Alternations
  - Graduated measures
  - Graduated values
  - Growth
- (b) Balance
  - Of measures
  - With symmetry
  - Without symmetry
  - Of colors
- (c) Harmony
  - Similarity, something in common
  - Uniformity
  - Proportion
  - Of related objects or parts
  - Of colors

III. Pictorial Design
- As the expression of an idea
- Line
- Color
- Arrangement of parts

IV. Constructive design including decorative design
- (a) The structural emphasis
  - The principle of growth
  - The primary mass and its proportions
- Horizontal and vertical subdivisions
  - Appendages
  - Enrichment of contours or outlines
  - Surface enrichment
  - Color

V. Expression
- Inspiration
  - Direct from nature
  - The proper use of historic ornament and of other reference material
- The play impulse

### III—Color

- Definition of color
- Color theories
  - Based on pigment
    - Mixing
    - Matching
  - Based on light
    - Choice
    - Harmony
    - Taste
- Properties of color
  - Hue—name
    - Red, yellow, green, blue, purple
  - Value—light
    - Light and dark
    - Tint, middle value, shade
  - Chroma—strength
    - Strong or weak
- Color qualities
  - Warm
  - Cold
- Balance
- Color combinations
  - Monochromatic
  - Complementary
  - Triadic
  - Analogous
  - Dominant

#### Freehand Representation

I. The pictorial quality
- Composition
  - Unity, balance, rhythm, harmony principality, subordination
  - Line
  - Color including dark and light and aerial perspective
    - Hue
    - Value
    - Chroma
    - Light, shade, shadow, reflections

II. Perspective of area
- Apparent size in relation to distance

III. Perspective of line
- Picture plane
- Center of vision
- Planning a drawing

IV. Principles governing the representation of parallel lines in a horizontal plane.
- Illustrated in simple natural out-of-door-views

V. Principles governing the representation of rectilinear objects, exterior and interior views
- With one set of horizontal edges parallel with the picture plane
- With no set of horizontal edges parallel with the picture plane

VI. Principles governing the representation of rectangular surfaces oblique in reference to the ground.
VII. Principles governing the representation of cylindric objects in various positions.
VIII. Principles governing the representation of conic and pyromidic objects
IX. Principles governing the representation of natural objects (growth, force)
- Flora
  - Flowers, trees, etc.
- Fauna
  - Animals, the human figure, birds, etc.
    - Proportions at various stages in development
    - Bones and muscles
    - Balance
    - Action

X. Principles underlying technical rendering
- Accenting
- Light, shade and shadow
- Color
- Rendering in pencil, charcoal, crayon, pen and ink, water color, oil color

### IV—Lettering

I. Origin of the alphabet
II. Evolution of styles in lettering
III. Lettering as design
IV. The standard Roman alphabet
- Capitals
- Lower-case letters

V. Method of constructing the Roman capitals
- The letters I, L, T, H, E, F
- The letters P, B, R, D
- The letters O, Q, C, G, S
- The letters U, J
- The letters V, A, Y
- The letters N, M, W
- The letters X, Z
- The letter K

VI. Method of constructing the Roman lower-case letters
VII. The standard italic Roman alphabet
VIII. The Gothic alphabet
IX. Script or engrossing alphabets

### V—Working Drawings

I. Definition of working drawings
II. Use of instruments
III. Principles underlying pencil technic
IV. The alphabet of lines
V. Dimensioning
VI. Lettering
- Vertical capitals and lower case letters
- Inclined capitals and lower case letters
- The formation of words and sentences

VII. Theory of orthographic projection
- Preference of the third angle
- Drawing to scale
- Sections
- Auxiliary views and sketches made freehand

VIII. Bills of material
IX. Isometric drawing
X. Inking and tracing
- Order of inking
- Erasing

XI. Blueprinting
XII. Screw threads
- The helix
- Bolts and screws

### VI—Appreciation

I. Source of the art under consideration
II. Evolution of the art
- History
- The masters

III. Present significance of the art
IV. Characteristics and function of the product
- Sense analysis and interpretation
  - Sight
  - Feeling
  - Hearing
  - Smell
  - Taste
- Reconstructing of mental images
  - Placing the product in its appropriate surroundings, historically, geographically, etc.

V. Material used
- Formerly
- At present
- Grades and qualities
- Sources
- Why used?

VI. Processes involved in making
- How performed
- Formerly
- At present

VII. Tools, machines and appliances used
- Functions
- How operated

VIII. Choice
- What constitutes excellence in the product?
- Discrimination

IX. Contact with home, school and community life

X. Liberalizing and cultural elements in the art
Contact with literature, music, the drama, etc.
XI. Vocational opportunities

## GAIN OF ART IN SCHOOLS.

### Survey Which Reveals Especial Interest in Its Industrial and Commercial Phases.

The nation is awakening to a realization of the importance of art in civilization, and there is no doubt of increased art activity in education in this country, in the opinion of Royal Bailey Farnum, Principal of the Massachusetts Normal Art School and Director of Art Education of the state. His views are set forth in a recent publication of the United States Bureau of Education. It is evident that very general emphasis has been placed upon the industrial and commercial phases of art, probably with commercial or advertising art receiving the most attention. This is attributed to the rapid development of the poster and with it all forms of printed design, all of which received an unprecedented impetus during the war.

This industrial application is borne out, says Mr. Farnum, who forms his conclusions from answers to a questionnaire sent to leading art educaters, directors, supervisors and teachers throughout the country, by the character of work outlined by the graded art textbooks, usually planned and edited by experienced educators. In New York State, for instance, the outstanding features to receive special emphasis in the last two years are, among others, "Art education realized through the subject of industrial arts in grades one to six, combining drawing and manual training motivated by a study of the industries."

### Marked Progress Since 1920.

From California comes this statement: "The manufacturers themselves are seeking the schools and helping most generously," while another writer says: "The growth in the point of view of how to apply art in the home, in clothes, and in advertising surroundings has been enormous. This, in my judgment, is the unavoidable trend of things in the next two years." And yet, points out Mr. Farnum, nearly all the art leaders, in their personal beliefs and local teaching, stress the cultural or appreciation phase, according to their questionnaire returns.

While in many directions art had made strides prior to 1920, and art education likewise, Mr. Farnum says, yet up to that time no one would contend that we were either a nation of artistic people or of patrons of art. "The year 1920," he continues, "marked a period of greatly increased recognition of the great value of art, especially in the industrial world. The nervous tension of the war had let down, and reconstruction in every direction was well under way. The lessons of the war were being learned and an attempt was being made to put them into practice. More advertising, more color, more daring design, more war memorials, and many more activities were demanding art.

"In turn art teacher and supervisor, always alert to outside demands, were reconstructing their ideas and planning for richer courses. Closer connection with world production, trade and commerce, and the art necessary for their development, were being studied. The socalled new 'project method' in education, an old friend of the art teacher, was loudly announcing itself and by its very nature was demanding closer contact with art and handwork. Dramatic art and pageantry were asserting themselves with their cry for color and costume. Thus the situation was bright and the opportunity never better for carrying forward this phase of esthetics in education.

### National Trend a Factor.

"In summing up the results of the questionnaire it would seem that national tendencies have a direct influence on art education, for there has been apparent an invigorated industry with its widespread advertising; that art applications require appreciation and taste in designers and consumers, therefore they are necessary objectives in art education; and, that to train in taste and appreciation, and to make intelligent and successful correlations with industry, costume, or the home, there is need for sound drawing and design expression.

"The past two years have unquestionably witnessed a stabilizing of policy and aim. The seasons, holidays, and world of form no longer become the basis for art course study. There seems to be a generally recognized attempt to relate all courses to the common manifestations and applications of art expression wherever that may be found and with it the exposure, at least, of children to real conditions of modern civilization and community life.

"New York State has perhaps gone to one extreme in the last two years, at least in so far as art in the elementary grades is concerned. The industrial point of view is dominant even to the exclusion of the older claim that drawing and art might exist in part for their own sakes and not always for their application. While other objections than industrial are recognized, the present effort is not only to industrialize art but to establish a new school study combining with art all other handwork subjects.

"In general, high school art courses are elective, and oftentimes the courses are determined by the wishes of the greatest number of applicants for drawing. Such courses may do one of two things: they may find really talented students and send them on to professional training, or they may offer additional opportunities for the development of good taste and intelligent appreciation. In any case, the courses are much more specialized than in the grades."

Mr. Farnum points out that the shortage of teachers during the war still prevails, even though salaries have failed to drop and in many cases have been increased. In the last two years vacancies have appeared almost continually without diminishing. There is urgent need for more young men, as well as women, to enter the teaching field, he says.

MANUAL ARTS EXHIBIT AT FLINT, MICH. MR. R. E. THOMPSON, TEACHER.

## VOCATIONAL GUIDANCE INFORMATION.

Mr. H. E. Stone, educational and vocational guidance counselor at Erie, Pa., in connection with the operation of a vocational guidance program, has outlined two circulars of information for use in the schools. The first which is entitled "desirable information for boys' and girls' counselors" contains data on inheritance, education, talents, health and physique, moral qualities, social efficiency, and vocational experience. The sheet contains the following detailed information:

**Desirable Information for Boys' and Girls' Counselors.**

Name..... Age..... Grade.....Teacher.....

**I. Inheritance:**

1. Father living?..... Vocation?..... Mother living?..... Brothers?..... Sisters?.....
2. Vocation of father?..... Grandfather?.....
3. Has there been any particular line of vocations noticeable on either side?.....
4. Have any of his or her ancestors been gifted in any particular line?.....
5. Education of parents?.....
6. Is there any indication of inherited tendency or ability in the pupil's record?.....
7. Will the finances of the family permit completion of High School?.....College?.....

**II. Education:**

1. General standing? .....
2. Is Student passing?.....
3. Best study? .....
4. Poorest study? .....
5. Habits of study, regular?.....Intermittent?....
6. Real desire for study?.....
7. Choice if free to study?.....
8. What would the pupil rather do than study?.....
9. What books does the pupil remember best?.....
10. The pupil's favorite book?....Kind of books?....
11. What influence has the reading produced?.....

.....

.....

FIVE—36688—IND ARTS

12. Has the pupil any special ability or learning in his educational experience? .....
13. If permitted to choose definitely between the following lines, what ought the pupil to take: Professional?... Commercial?... Industrial?....
14. Favorite movie actor?.....

**III. Talent:**

1. Has the pupil a gift for music?.....
2. Has he talent in art?.....
3. Is he skilled with his hands?.....
4. What can he do better than others of his age?....
5. What is his greatest achievement?.....

**IV. Health and Physique:**

1. What is the pupil's health record?.....
2. Has he lost time from sickness?.....
3. What is the family health record?.....
4. Is he strong and robust?.....
5. Has he good endurance?.....How tested?....
6. Experience in athletics?.....
7. Experience in manual labor?.....
8. What forms of sport does he like best?.....
9. What vocations would his health or tendencies forbid his entering?.....
10. What vocations requiring nervous or physical strain could he not endure?.....
11. What vocations might prove the best aid to improving his physical condition?.....

**V. Moral Qualities:**

Is the pupil exceptionally strong in any of the following qualities:

1. Honest? ..... 2. Prompt? .....
3. Conscientious? ..... 4. Efficient? .....
5. Reliable? ..... 6. Tactful? .....
7. Personal habits?.... 8. Clean? .....
9. Religious? ..... 10. Persevering?.....
11. Has he any weakness or temptation that would endanger his career in any particular vocation?...
12. What personal characteristics that are necessary to his success in any career do you think he possesses? .....
13. Is his ambition strong enough to hold him to a decision? .....
14. Is he ready to take the next step forward at any cost? .....
15. Idea of a good time?.....

**VI. Social Efficiency:**

1. Of what societies has he been a member?.....
2. Of what organization is he now a member?.....
3. Of what church is he a member?...Attendant?...
4. What offices has he held in any organizations?...
5. What evidence has he shown of executive ability?
6. Is he a good leader?.....
7. Is he a good follower?.....
8. Is he a kicker or obstructionist?.....
9. Can he work harmoniously with others?.....

**VII. Vocational Experience:**

1. What positions has he held
   Place?.....Place?.....Place?.....
   Time?.....Time?.....Time?.....
   Wages?.....Wages?.....Wages?.....
   Kind of work?..Kind of work?..Kind of Work?..
2. What work appealed to him most?.....
3. Did he find any work for which he was unfitted? ..... How?.....
4. In his experience did he find any special ability or skill that he had developed?.....
5. Did his experience point out for him any special line of work or study that he ought to follow?...
6. Does he save money?.....

The second circular is a so-called "self-analysis sheet for counseling purposes" and contains data on identification, family record, physical record, experience, school record, personal qualities, avocations, and choice of life-work. The sheet contains the following detailed information:

**Self-Analysis for Counseling Purposes.**

**The purpose of this form is to help discover vocational interests and activities by suggesting how to observe one's own tendencies.** The information given here will be regarded as strictly confidential. Please answer each question to the best of your ability at this time. Any opinions or choices made now may be changed in the future.

**I. Identification:**

In this statement include (1) your idea of some of the special qualifications needed to fill the position; (2) some proof that you are deeply interested in this kind of work; and (3) why you think you are fitted for it.

Full name.....Date.....
Last name first

Residence .....Phone.....
Date of birth.....Birthplace.....
Check School, Academy ( ), East ( ), Central ( ), Gridley ( ).
Grade in School: Seventh ( ), Eighth ( ), Ninth ( ), Sophomore ( ), Junior ( ), Senior ( ).
Name of parent or guardian.....

**II. Family Record:**

State the occupation of your father.....
State the occupation of relatives whose work has interested you:

| What relative of yours? | Occupation of relative. |
|---|---|
| 1. ..... | |
| 2. ..... | |

Do you live at home ( ); Board ( ); Do you earn your board ( ); Room ( ); Clothing ( ); Spending money ( ); Do you help support family? ( ).
Check that part of your living which you must earn after leaving school:
Board ( ); Room ( ); Clothing ( ); Spending money ( ); All ( ); None ( ).

**III. Physical Record:**

Height....feet....inches. Weight....lbs. Weight: increasing ( ); decreasing ( ); stationary ( ).
Teeth good ( ); poor ( ).
General state of health: robust ( ); fair ( ); poor ( ).
What diseases have you had?.....
Hereditary diseases in Family ( ). Name them....
Exercise: regular ( ); irregular ( ); heavy ( ); light ( ).
Sports: interested ( ); not interested ( ); what sports? .....
Play on team ( ); captain ( ).
What physical defects have you?.....

**IV. Experience:**

State occupations at which you have worked more than a week. None ( ). See below ( ).

| Age when it began | Hours per week | Total weeks employed | Earning per week |
|---|---|---|---|
| ..... | | | |
| ..... | | | |
| ..... | | | |

What features of the work interested you?.....
What features did you dislike about it?.....

**V. School Record:**

Indicate the two GROUPS OF SCHOOL SUBJECTS which have most interested you, by placing a figure "1" before that which has most interested you and a figure "2" before that which next most interested you.

(It may help you if you will also compare yourself with others of your own class.)

....Fine and Applied Arts:
(Freehand drawing, design, lettering, craft work.)
....Commercial Subjects:
(Bookkeeping, commercial arithmetic, commercial law, commercial geography, salesmanship, shorthand, spelling, typewriting, writing.)
....Drafting:
(Machine design, drafting practice architectural drawing.)
....English.
(Rhetoric, literature, expressional English.)
....Foreign Languages:

**Changes at Carnegie.**

Any students who desire may later obtain a copy of this blank from the vocational counselor at the school, and fill it out at leisure, after talking it over with their parents or the counselor.

(French, German, Latin, Spanish.)
....History, Civics and Economics:
(American, ancient, mediaeval, modern, industrial history, economics.)
....Household Arts:
(Cookery, millinery, sewing, dressmaking, home nursing.)
....Manual Arts:
(Automobile mechanics, bookbinding, cabinetmaking, electrical construction, machine shop work, patternmaking, sheetmetal work, woodworking.)
....Mathematics:
(Algebra, geometry, trigonometry.)
....Music.
....Science:
(General science, botany, chemistry, physical geography, physics, zoology.)

Write a "T" before each group which you have numbered above for which you believe that the intest was due mainly to the TEACHER, and an "S" before each of those numbered for which you believe the interest was due mainly to the SUBJECT.

What kind of reading have you done?.....
.....
.....
.....
Name some books you have read within a month....
.....

**VI. Personal Qualities:**

So far as you can notice a difference in your own interests between each of the following contrasts, check those WORKING CONDITIONS which appeal to you:

( ) Slow movements.
( ) Rapid movements.
( ) Less responsibility.
( ) More responsibility.
( ) Doing the same thing.
( ) Wide variety in work.
( ) Methodical work.
( ) Meeting new conditions.
( ) Regular time for work.
( ) Irregular time for work.
( ) Larger future success.
( ) Smaller immediate success.
( ) Work requiring calmness.
( ) Work requiring enthusiasm.
( ) Changing from place to place.
( ) Always working in the same locality.
( ) Greater pay with risk of discomfort.
( ) Less pay with more safety and comfort.
( ) Indoor.
( ) Outdoor.
( ) Original.
( ) Imitative.
( ) Planning.
( ) Carrying out plans.
( ) Skilled hand work.
( ) Skilled heavy work.
( ) Broad planning.
( ) Attention to details.
( ) Directing.
( ) Following directions.
( ) Working by yourself.
( ) Working with others.
( ) Working with things.
( ) Working with people.
( ) Thoughtful hand work.
( ) Thoughtful head work.

Among the following DESIRABLE TRAITS underline the **seven** in which you are strongest, and in which you would trust yourself most to meet the competition of others.

Among the seven, underline with two lines the **two** strongest in you.

Among the traits given below, place crosses before the **two** in which you are the weakest.

| | |
|---|---|
| Accuracy | Planning |
| Common sense | Quickness |
| Concentration | Reasoning |
| Foresight | Sensitiveness |
| Imagination | Thoroughness |
| Impulsiveness | |
| Information | |
| Initiative | |
| Judgment | |
| Memory, visual | |
| Memory, Auditory | |
| Originality | |
| Ambition | Loyalty |
| Cheerfulness | Neatness |
| Convincingness | Obedience |
| Courage | Patience |
| Courtesy | Perseverance |
| Energy | Reliability |
| Enthusiasm | Self-control |
| Health | Self-reliance |
| Helpfulness | Resourcefulness |
| Honesty | Tact |
| Industry | Temperance |
| Leadership | Uprightness |

**VII. Avocation.**

What do you do OUTSIDE OF SCHOOL, or recreation or otherwise, that you think will help you in your future occupation? For example: kind of reading, your hobbies, exhibitions or places you visit, your work in church, clubs, etc., etc.

**VIII. Choice of Lifework.**

Select the three KINDS OF ACTIVITIES listed below at which you think you would do best and at which you think you would be contented to work permanently. Place the figure "1" before that group which you would place first for yourself. Place the figure "2" before your second choice, and "3" before your third choice.

Any occupation will involve a number of these activities, but number only those three groups which appeal most to you. (Sometimes it is well to begin by excluding those you dislike.) It may help you if you will also compare yourself with others of your own age.

( ) **Growing Plants,** as in farming, gardening greenhouse, etc.
( ) **Care of Animals,** as in stock raising, care of horses, etc.
( ) **Operating Engines,** as locomotives, automobiles, steam plants, etc.
( ) **Operating Machines,** as in manufacturing, using linotype, etc.
( ) **Installing Equipment,** as electrician, plumber, gas fitter, etc.
( ) **Construction Work,** as in building, concrete work, railroad, and highway construction, engineering, etc.
( ) **Delicate Muscular Movements,** as dentists, instrument maker, wood worker, etc.
( ) **Discovering and Repairing Defects,** as a jeweler, automobile repairman, telegraph repairman, etc.
( ) **Transporting Activities,** as railroad operation, express, mail, etc.
( ) **Meeting and Directing People,** as secretary, floor manager, conductor, etc.
( ) **Teaching,** as in school, shop, etc.

( ) **Welfare Work,** as in social settlements, industrial plants, Christian Associations, churches, etc.
( ) **Advisory Service,** as physician, lawyer, consultant, banker, etc.
( ) **Organizing People,** as in societies, in work gangs, in industrial and business concerns, etc.
( ) **Influencing People Directly,** as in selling, preaching, campaigning, etc.
( ) **Influencing People Indirectly,** as in advertising, writing, newspaper work, etc.
( ) **Organized Planning,** as in wholesale and retail business, managing institutions, engineering projects, etc.
( ) **Scientific Work,** as in laboratories, museums, in research, etc.
( ) **Recording and Systematizing Records,** as in office work, stenography, bookkeeping, cashier, library work, etc.
( ) **Entertaining People,** as musician, actor, speaker, etc.
( ) **Artistic Skill,** as in decorating, window dressing, millinery, costuming, handicraft, printing arts, etc.
( ) **Artistic Creation,** as in writing, designing, composing music, etc.
( ) Field of Activity not on this list and described as follows: .....

All things considered, what occupation do you think you will try to follow?.....

Remember the unpleasant features of the work, and the conditions under which it would be carried on. Consider also whether you have the necessary health and strength, whether you can get the necessary training, and whether this occupation will give you the opportunity to utilize your good traits, and follow your interests.....

In making the above choice of a vocation have you previously talked the matter over with anybody? No ( ). Your parents? ( ). Your teacher? ( ). A vocational counselor? ( ). A friend? ( ).

Imagine your schooling completed and yourself applying for a position in your chosen occupation. Write below what you would say to the person to whom you apply.

## THE POSTER IN ART EDUCATION.

**Marie Carey Druse.**

The teaching of commercial art in public schools has come to stay. Posters in any community stir civic pride and make for better homes. They are a reprimand to the unprogressive and teach better things and better living generally.

The world war intensified the demand for designers of strength and originality. Posters proved their national influence in selling liberty bonds. The American Red Cross knew the value of this form of advertising and probably employed it more than any other organization with the result of bringing several million dollars into its treasury for war work. A great proof of the poster value was shown in the American Legion drive for new members. Some of our most noted artists continue to design colorful appeals for the Navy and Army. The Inter-Church World Movement of North America was the greatest paid advertising campaign ever undertaken by religious organizations. One eminent clergyman declares that "The Poster is the New Church Bell." The National Child Welfare Association of New York City did a great amount of good in their "Good Citizenship" campaign. The Ministry of Labor in Great Britain is using posters in its effort to bring men and women industrial workers and employers together. Posters have been used extensively in Educational Campaigns. In Arkansas they were used in the "Campaign for the removal of Illiteracy." These were appealing to the uneducated folk and resulted in the "Moonlight Schools." At Victoria, B. C., a very successful poster competition was carried on by the "Society of Prevention of Cruelty to Animals," and a similar competition in the "Health Crusade" in cities in northwest Iowa. Spokane had a "Drink More Milk" campaign among school children. One might go on indefinitely showing how work has been done along these lines.

The man who sells a manufactured product knows that it plays a large part in both the making and the selling of the article, that goods well made and beautifully designed, can stand any competition. Many manufacturers tell the story of their products in color, and with skill that may rival any framed bit of artist's work. The fact that packages are put up attractively make them appealing and may determine their first purchase.

Colors used correctly with a view to effect, are of untold value in advertising and should be used simply and directly in the most spectacular, effective way. The primary function of color is to get attention. Red has the strongest attention value, so in using it we put it in the spot which needs the emphasis. All colors have more or less attention value and most of them are used at times for this purpose. When the body of a poster is in color, black may be used to point out the center of interest; on the other hand when the background is black or some other lifeless color, blues, greens and other colors may serve to emphasize parts of the illustration. Color takes a hold on our minds. Advertisers have learned that it pays to show things as they are. Who can look at the juicy mince pie without an inclination to buy a package of "None Such Mince Meat?"

Fruit producers realize the strong influence of poster advertising in color. The writer while in California was especially interested in seeing the extensive campaign carried on by the Sunkist orange producers, and the astonishing number of colored posters put out for "Orange Week." The apple grower tells us that red apples sell more readily than the green—hence the poster "Where the Red Apple Grows." Makers of cooking oils, toiletries, trucks, bacon, practically all producers realize the value of color in advertising and give it the importance it deserves. In fact every manufacturer and up-to-date business man recognizes the fact that "Beauty is a Business Asset." So prevailing is this sentiment that many noted artists have turned their genius for color and composition to the art of poster making. Howard Pyles, Maxfield Parrish, Jessie Wilcox Smith, Harrison Fisher, Edward Blashfield, Montgomery Flagg, Howard Chandler Christy, and Coles Phillips are among the number.

With the coming of real art in the modern posters, there will be less prejudice against them. Not all posters have reached the summit of beauty attained by our masters of color, but it takes time for anything to develop.

Posters influence home life and help to maintain better standards of living. The American woman knows how to take advantage of everything that is offered her. This is especially true of household appliances. Wonderful progressive changes have been made along these lines in the last two generations. Women with the help of good advertising have made it so. This has largely come about by the poster. She is told of the latest ideas in home furnishings, of new appliances, how to conduct her household in simpler ways, of new table delicacies, how to choose fabrics, better wall paper and floor coverings. To all of these the poster points the way and those which appeal to her imagination, to her good taste and logic, have shown her the better way of doing things.

The poster is a certain medium for impressing an idea on the child mind. After children are old enough to read, copy does not always interest them, but every child will stop and look at a picture and it is very noticeable how extensively pictures of child life are used in advertising. When a poster campaign is on more books are read, more pictures collected, and photographs taken, a general research work is done. It is this general interest, this active search for good things that makes the appearance and progress of the poster such an asset in the development of public taste.

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**A Few Hints on Building Radio Equipment** is the title of a bulletin just issued by Mr. R. W. Wagner, superintendent of schools, Webb, Iowa. The bulletin contains practical information on the building of various types of radio receiving apparatus and suggests the difficulties which can be avoided.

# NOW, ARE THERE ANY QUESTIONS?

*This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.*

### Finish Questions.

365. Q: (a) Please advise me how glue and stain may be removed from a finish bench which is covered with galvanized iron.

(b) What is a good method of finishing toys?

(c) How may orange shellac be prepared for the manual training shop?

A: (a) I am pleased indeed to note the care with which you have made your glue and stain bench by cover-it with galvanized iron. It may be readily cleaned by mixing a cupful of Gold Dust powder with one quart of boiling water and applying thickly to the galvanized iron. Let stand undisturbed for half an hour and then scrape the top with a wide putty knife. Wash off thoroughly with a fiber floor scrubbing brush and repeat if necessary. One or two applications should be sufficient to make it thoroughly clean.

(b) Toys and coaster wagons are finished in one of two ways. The first treatment employs the use of colored toy enamels or color varnishes which are either sprayed on or else the parts are dipped in the pigment varnish and hung up to dry. A method which I find thoroughly practical and quite as satisfactory is carried on as follows: Colors ground in japan such as chrome green, medium, light or dark, chrome yellow, canary, medium and dark, scarlets, etc., may be thinned out very thin with turpentine and a tablespoonful of boiled linseed oil or preferably varnish per pint of material. This should be as thin as possible and still cover well performing the function of a glazing color rather than a paint. It should be applied with a soft, short bristle brush of the fitch flowing type. This ground coat should dry 24 hours in a warm room and in the case of animal toys, eyes, tails, feet with their accompanying peculiar markings may be represented in other colors, also of the japan type and again allowed 12 hours to dry. The whole toy may then be given a coat of good floor varnish carefully brushed out. After drying two or three days it may be sanded with a split paper if desired and revarnished. The advantage of the pigment enamels as manufactured by various companies for toy purposes accomplish the work of producing both color and varnish in the finish at the same time and hence for manufacturing purposes are most desirable. The second method seems to me to be more valuable for purposes of instruction in that it affords practice work of radically different types but still is entirely practical.

(c) With a little care and neatness orange shellac stock can be made in the average manual training shop. It should be confined, however, to this grade only and should not include the cutting of white shellac which because of its peculiarities during the process of solution often make it an extremely difficult material to dissolve. A clean covered receptacle of either glass, earthenware or granite ware is necessary and should be of a capacity somewhat larger than the unit batch. For instance, if a gallon is used as a batch it is best to put it in a five or six quart container avoiding tin, copper or iron. To one gallon of denatured alcohol stir in four pounds of flake shellac, letting stand under cover and stirring as occasion may offer. Twenty four hours generally is sufficient to complete the solution. It is desirable to strain this mixture through a double fold of cheese cloth and put away in a clean earthenware jug ready for use. For brushing qualities is generally reduced from one half to two thirds with denatured alcohol in order that it may run from one and a half to two pounds of gum per gallon during use.—Ralph G. Waring.

### Finish for Period Furniture.

372. Q. We will soon have ten excellent pieces of period furniture made from the best black walnut and mahogany completed in our shop. I am very anxious to give them the best finish possible. Therefore, I would like to know the best way to finish black walnut and mahogany so that the pieces may have a glossy finish and some a satin finish. Should water stain be applied hot? What is a Van Dyke filler? When oil is used on walnut, do you mean boiled linseed oil? Where can you get materials such as dry stains, burnt sienna, burnt umber, 000 split paper?—W. E. P.

A: You are referred to the following back issues of the INDUSTRIAL-ARTS MAGAZINE which offer many suggestions as to the finishing of mahogany and black walnut:

February 1918, June 1918, June 1917, August 1917, December 1917, April 1920, May 1920, Dec. 1920, January 1922, March 1922, July 1922, August 1922, October 1922 and March 1923.

In general it is best to apply water stains hot, using a granite or glassware utensil during the heating process. It should be applied with a rubber set black China bristle brush having a brass ferule rather than tin which is very easily destroyed through the corrosive action of this stain.

A Van Dyke filler consists of a Silex base or natural filler which has been tinted to the desired shade with colors ground in oil of which Van Dyke brown is an example.

It is sometimes desirable to deepen the tone of stained walnut after the color has dried. This is accomplished by applying a very thin coat of raw linseed oil reduced with two volumns of turpentine to which mixture has been added one teaspoonful of dark japan drier per pint of liquid. Where oil is used to rub the dried and hardened varnish either crude petroleum oil or Standard Oil Co.'s Floor Oil may be employed in conjunction with rubbing felt and pumice stone.

If you will give me an approximate idea of the amount of dry stain, burnt sienna, and burnt umber required, I will be glad to leave your inquiry with a company capable of supplying your needs.

Split papers for sanding varnish begin with 00000 and run to 10-0. They consist of a specially prepared cylinder stock faced with the abrasive on two sides and because of their fiber construction are easily split into two portions thereby enabling the paper to cut faster with less glazing because of its greater flexibility. Some finishers make a practice of dampening slightly the back of this split paper in order to secure greater flexibility. You are referred to the April 1923 issue of the INDUSTRIAL-ARTS MAGAZINE dealing with Paint Shop Rubbing Practice. I find that the most economical and best grade is a 6-0 double surface garnet paper sold by the Carborundum Company of Niagara Falls, N. Y. A ream bought this month cost $7.35.

Leg stock having sap streaks should have the latter stained first with a full bodied stain applied with a very small brush of the water color type. This should be allowed to dry to the point when the wood is still slightly damp at which time the whole piece should be given a second coat of stain. This generally suffices to produce an even result. If, however, it fails to do so, apply a coat of reduced orange shellac over the work, allow to dry hard, after which any off color streaks may be toned with a 3/16" lettering brush and a reduced shellac solution made from orange shellac, tinted with alcohol soluble black J. and alcohol soluble Bismark brown to produce any shade of color in brown tones ranging from black to red. I find it advantageous to make up these tinted solutions by putting small amounts in a two or three ounce bottle and adding alcohol sufficient to make a saturated solution. The addition of these two materials drop by drop enables one to quickly produce a shade coat of any desired tone. After the shellac work is complete, sand with a split paper, fill, varnish and rub as desired.—**Ralph G. Waring.**

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### TO MEET IN ST. LOUIS.

The Vocational Education Association of the Middle West has announced that its tenth annual convention will be held in St. Louis, January 16, 17, 18 and 19. The local committee will be headed by Superintendent J. J. Maddox and Mr. Lewis Gustafson, of the David Ranken, Jr., School of Mechanical Trades, will act as vice-chairman. The meetings and the exhibits will be located in the Chase Hotel.

# Better Work

*East Texas State Normal College, Commerce, Texas*

The Disston Educational Department is at your service for any information or help in manual training. The following books and charts, carefully prepared and edited, are used as text books in schools and colleges throughout this country and abroad. They are aids to better work which we will be glad to furnish free to any school or instructor who is not already supplied:

Saw, Tool and File Book,
Lumberman's Hand Book,
The Saw in History,
The File in History,
The Pruning Book,
How a Disston Hand Saw is Made,
Disston Saw Chart,
Disston File Chart.

Good, well constructed tools are the training school instructor's almost indispensable aids. There's a satisfaction in their use which holds a boy's interest and practically eliminates careless work.

That's why so many teachers, realizing that they insure the success of their own efforts and better work from pupils, insist on Disston Saws, Tools, and Files in the workshop.

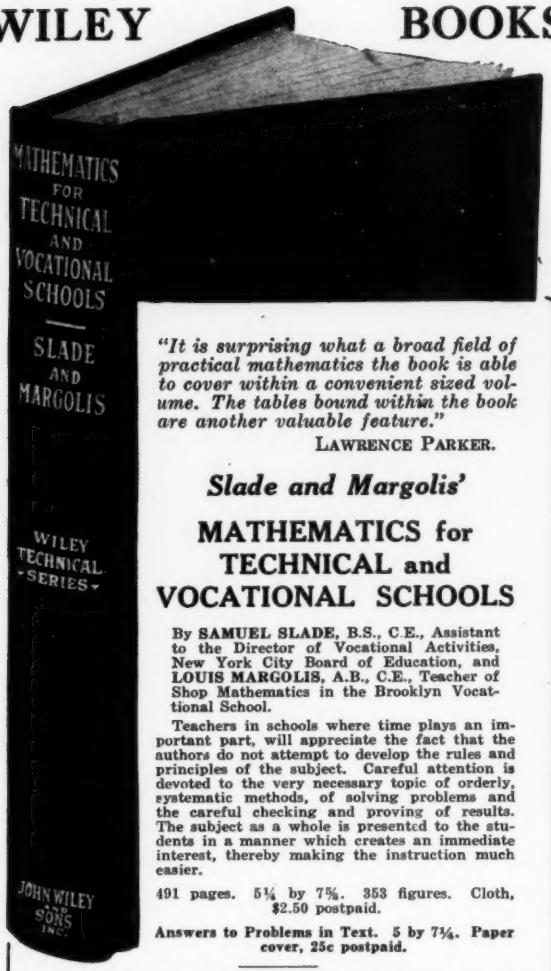
Henry Disston & Sons, Inc.

Philadelphia, U. S. A.

**DISSTON**

**SAWS TOOLS FILES**

# WILEY BOOKS

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IAM 9-23


## VOCATIONAL EDUCATION AT THE N. E. A.

The Department of Vocational Education and Practical Arts of the National Education Association held three meetings during the 61st annual convention at Oakland and San Francisco, Calif. Mr. L. H. Dennis, of Harrisburg, Pa., presided over the sessions. The leading speaker at the first meeting was Mr. Arthur D. Dean, formerly of Columbia University, who discussed the extent to which the public schools are responsible for occupational training. The second session was a joint meeting with the National Council of Education and took place under the auspices of the council's committee on vocational education. The speakers were Mr. D. A. Brillhart of Oakland and Miss Maude I. Marchie of Sacramento. The final session was participated in by the Vocational Education Association of California and brought to the foreground the need of centralizing the association efforts in the field of vocational education. The proposal of uniting the national, the middle western and the California bodies within the N. E. A. was strongly advocated. Prof. Edwin A. Lee made a strong plea for greater unity in California educational matters.

## NEWS AND NOTES.

**Teachers' Salaries.** The trustees of the vocational school at New Bedford, Mass., have voted general increases to the teachers in the school but failed to carry a motion making the maximum salary of women teachers equal to that of the men. The motion was made by the women but the men were solidly against the plan. The increase in the payroll will amount to between $5,000 and $6,000 annually and approximately $1,400 for the first three months of the ensuing year. The new schedule is as follows:

| | Minimum | Maximum |
|---|---|---|
| Director | $3000 | $4000 |
| Department heads | 2500 | 3000 |
| Men instructors | 1650 | 2300 |
| Women instructors | 1300 | 1800-2000 |
| Supervisors, women's evening work | 1600 | 2100 |

The $2000 maximum for women instructors is for the head of the cooking department. The annual increases granted are $200 to the director, $100 to the department heads, $150 to the men instructors, $100 to the women instructors and $100 to the evening supervisor.

**Cooperative Training.** Beginning in September, the DuPont Manual Training High School at Louisville, Ky., will offer courses in cooperative training. About two hundred boys will take courses in technical training, alternating every two weeks between school and employment in some factory. The purpose of the course is to offer to boys over 16 years of age an opportunity to pursue practical trade training.

**State School Fund.** Rockford, Illinois, schools have been given $6,890 by the state vocational board as reimbursement for vocational courses in trade and industrial subjects. The amount of $1,445 has been given for expenses incurred in maintaining classes in vocational agriculture in the high school.

**Salary Scale Proposed.** A salary scale for vocational teachers that shall act as an incentive to teachers to stay in one place has been proposed by Shelton Phillips, former state director of vocational education for Florida. Under Mr. Phillips' plan, the salary paid by the state would remain stationary and the counties be asked to supplement the salaries each year. A teacher removing to another place would start again at the first year's salary.

**Metal Work Offered.** The vocational work offered in the schools of Newark, N. J., has been extended to include metal work. Machinery, tools and equipment to the value of $1,000 have been installed for the purpose.

**State Aid.** The schools of Rock Island, Ill., have been reimbursed to the extent of $180 for expenses incurred in offering work in trades and industries.

**Vocational Agriculture Popular.** The training of farm boys in vocational agriculture has become more popular each year in Ohio as evidenced by the growth in the number of schools from 21 in 1917-18 to 131 in 1923-24; and the further fact that over 2,500 boys receive instruction in these schools. The school at Lancaster has grown steadily, having 36 boys enrolled for the year 1922-23. The school offers six courses, covering four years of work and is intended to keep the boys on the farm and to make better farmers of them.

**Train for Building Trades.** Fifty boys in the schools of Pittsburgh, 25 in September and 25 more in February, will enter upon courses in the building trades. The work is to be offered in the newly purchased Alleghany Voca-

(Continued on Page XXIV)

# Final Date for Prize Essay Contest Extended to September 10th

## A chance for teachers of woodworking or directors of vocational education having under their charge the woodworking or cabinet making departments to write their ideas during the vacation months

Many teachers have expressed the wish that instead of closing our prize essay contest June 1st, we extend it to September 10th in order that they might write their ideas during the vacation season.

This we are glad to do, for nothing shall stand in the way of gathering the greatest collection of ideas on the educational value of woodworking in the training of boys ever assembled.

So, you may write your essay during your vacation days, if you wish, but you must signify before July 1st your intention of doing so. If you are one of those who have already entered the contest and think that this extension of time gives you a chance to write a better essay we will accept another one from you.

Pestalozzi, Fröbel and Salamon, all stars of the first magnitude in the educational firmament. The two former laid stress on the education of the child in his tender years. The latter carried the same principles to the boy in the grades. Many of you are extending this influence in the high schools and colleges. Tell us, therefore, what you are doing or propose to do to perfect the great work of vocational education, particularly as it is applied to Cabinet Making or Woodworking.

American Woodworking Machinery Co.

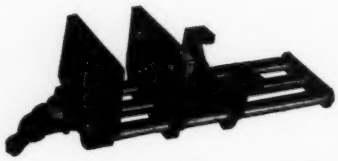
Educational Department

Rochester, N. Y.

Every eligible contestant will be rewarded for his effort with an elegant fountain pen valued at $6.00, and a series of cash prizes aggregating $10.000.00 is offered for the best essays.

For your information, we have prepared a folder giving complete details of the contest which we will send you immediately if you write for it.

# Vise Equipment of proven quality



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***World's largest makers of vises and anvils***

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**COLUMBIAN**
**Sledge-Tested VISES**


(Continued from Page XXII)

tional School. The boys will be trained free of charge in return for the use of the school for the continued training of service veterans.

**Poster Contest.** Since humane education was introduced into the Chattanooga and Hamilton County schools eight years ago, the Humane Education Society, at Chattanooga, Tenn., has conducted an annual humane story contest, awarding prizes for the best papers and best collections and placing in the schools many beautiful pictures. This year it had been decided to announce a poster contest, which appears to be growing in popularity throughout the country.

In the contest not as many schools were represented as in former contests, some fearing that without a drawing supervisor, they could not very well compete. The exhibit which was on display for a whole week in one of the windows of a local store, attracted a good deal of attention and familiarized the public with the work which the society has developed in the schools.

A statistical report of the contest shows the following:

Total number of schools represented, 29; total number of posters submitted, 1,001; total amount paid for pictures presented to schools, $131.50; total amount for framed posters, $71.25; total amount given in cash prizes, $79; total amount for books, $25.70; total amount paid for honorary certificates, $10.50; total amount subscriptions to the periodical Humane Record, $78.75.

**Manual Training Popular.** According to Prof. C. L. Jackson of the Kansas State Teachers' College, Emporia, manual training has become a popular subject for women. Eight women are taking work in the manual training department during the summer term, and they are proving as adept as the men in certain parts of the work.

It is pointed out that, while the women are somewhat awkward at machine work, they excel the men in accuracy and in the neatness and general excellence of the finished product. Of the eight women taking the course, four expect to teach next year and two will teach manual training. One woman took the course because she is interested in the work.

**Vocational Agriculture in Tennessee.** An analysis of the work in vocational agriculture for the year 1922-23 shows that there are fifteen counties in East Tennessee, represented by 22 schools, fourteen counties in middle Tennessee, represented by 25 schools and fifteen counties in West Tennessee, represented by 33 schools.

There was an enrollment of 280 in all day schools, 1264 in evening work for farmers, and 1115 in the junior project work in rural schools, a total of 5266 people taking organized instruction in agriculture.

The project profits in Vocational Agriculture for the year ending June 30, 1923, shows $224,703.33. There was spent for this work during the past year $123,412.31. The project profits returned $4.45 for every dollar of Federal money spent; $7.04 for every dollar of State money spent; $5.23 for every dollar of local money spent and $1.80 for every dollar of Federal, State and local money spent.

Project profits showed an over-plus of $100,291.02 after the entire cost of Agricultural Education had been paid; $135,996.29 after the entire cost of Trade and Industrial Education had been paid, and $175,462.83 in Vocational Agriculture after the entire cost of Teacher Training in Agriculture, Trade and Industries and Home Economics had been paid.

**Industrial Art School.** Under the sponsorship of a large group of representative business and professional men and women of Chicago, a movement is under way to establish an industrial art school in the city. The plans have been worked out by a joint committee consisting of a group from the Association of Arts and Industries and another from the Art Institute.

A fund of $200,000 is being raised for the new school which seeks to unite art and industry, give the artist an intimate connection with the life of the country, and make possible improvements in the artistic quality of American manufacturers so that they may compete with the products of Europe in design and attractiveness.

The present home of the school will be in the Art Institute, where classes in industrial arts are regularly held. The plans include the training of designers in furniture, jewelry, wall paper, fabrics, ceramics, printing, metal work and other commercial products.

The eventual home of the school, it is hoped, will be the fine arts building in Jackson Park, which is at present being remodeled. The fund of $200,000 will be a start

(Continued on Page XXVI)

*A general view of the Printing Department of the Seymour Vocational School, Newark, N. J.*

**The Kelly Automatic Press,** a machine that produces the finest kind of printing at a speed of 3,500 impressions per hour.

# Printing + Interest = Education

THE PRINT SHOP OF THE SEYMOUR VOCATIONAL SCHOOL, NEWARK, N. J., is not shown for the sole purpose of showing you the equipment, although you are probably interested in such equipment, but there is a greater significance in the picture. Note the interest of these future printers in their work. So great that not a boy even looked at the camera. They are printing their school paper, a beautiful twenty-four page booklet.

Boys, the sizes and ages shown, are not interested in a subject that doesn't appeal to them. Printing fascinates most boys. It teaches them the use of punctuation marks, the making of proper margins, the use of good English, correct spelling, capitalization, and indention in an accurate manner.

School Printing Outfits are inexpensive. They are designed for manual training, pre-vocational, vocational, trade, journalistic laboratory, and the four-activities-in-one-room types of instruction. The smallest school communities and all other types of schools to the the largest universities are installing printing.

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## Brief History of the Present Day Plane.

*(continued from the previous issue)*

After Mr. Bailey had made an iron plane, with an adjustable, iron cutter seat or frog, his inventions led him into the manufacture of planes on a small scale. He, however, fully understood that an association with a large manufacturer would afford him additional opportunities for inventing improvements, and so in 1869 he sold his business to The Stanley Rule and Level Plant, and the entire plane department was placed under his direct charge.

With the facilities of the Stanley plant, he was able to perfect the plane still further. The basic idea of the plane as originally invented by Mr. Bailey still features the modern plane.

This revolutionary movement in plane construction can be entirely credited to the inventive mind of Mr. Leonard Bailey. It has made possible better workmanship and increased production.

The most salient improvements which have been made in the modern plane as manufactured by The Stanley Works have resulted in additional strength, and have made the cutter more adaptable to adjustment.

The "Bed Rock" plane, a still further improvement in the art of plane-making, combines many of the excellent basic ideas of the "Bailey" with some of the recent inventions. The sides are flattened at the top and made parallel to the base line. The knob is larger and affords a better hold than the old style.

The essential difference, however, is a radical departure from the "heel and toe" type of the cutter seat or "frog." Its entire under surface is a plane surface and is in perfect contact at all points with the solid seat cast for it in the plane bottom. A tongue in the under side fits in a groove in the plane body, which insures it being square with the mouth of the plane when adjusted. The two frog clamping screws have been changed to make adjustment easier.

Every conceivable effort has been made in the construction and manufacture of Stanley planes, to produce a practical, serviceable, and economical tool.

A leaflet, "The Evolution of the Plane," may be obtained by writing The Stanley Works, New Britain, Conn.

**The Stanley Rule and Level Plant**
**The Stanley Works**
**New Britain, Conn.**

New York
Chicago
San Francisco

STANLEY
S.W.

Los Angeles
Seattle

(Continued from Page XXIV)

toward the acquirement of the building as the permanent home of the school.

**Pupils Repair Equipment.** The construction and repair of school furniture and equipment at the Trade High School, Columbus, O., has been undertaken by the pupils of the school. Boys in the advanced carpentry classes were assigned to the work under the direction of the instructors and were paid at the rate of forty cents an hour.

**Facilities Enlarged.** Facilities for offering vocational training in the schools of Oklahoma City, Okla., were enlarged during the vacation season.

**New Mexico Fourth in Farm Education.** New Mexico has been given fourth place in vocational agriculture. One of the advantages of the state is the evening program. There are eleven evening schools in various parts of the state attended by more than 500 farmers and their wives. The high standing of the state has come as a result of two years of effort in building up the standards of instruction. The farm shop work has improved at least fifty per cent through special instruction given to the teachers at the annual conference. Only western trained men are approved for teaching positions for the reason that men unfamiliar with western conditions cannot make a success of the work.

The demand for new departments has greatly exceeded the ability to render financial assistance. Although the legislature reduced the appropriation, through the aid of federal funds it is planned to increase the number of schools fully fifty per cent next year. The increasing demand for agricultural training is attributed to the growing appreciation of the educational and economic value of the work.

**Building Trades School.** Trade schools where young men can be taught the principles of the building trades in a six months' course are proposed by the mason builders' association of New York City to remedy the existing shortage of skilled workers. A fund of $500,000 will be raised for the establishment of such a school. The association points to the need of 2,000 to 4,000 bricklayers at the present time, with proportional numbers of workers in other crafts.

**Woodwork Exhibit at N. E. A.** An exhibit of office furniture and pieces for home use was held at the Oakland auditorium, Oakland, Calif., during the National Education Association convention.

**Vocational Commencement.** The third and last commencement of the Niagara Falls Vocational School at Niagara Falls, N. Y., was held on June 16th at the junior high school. Hereafter the vocational school and junior high school will be combined. Diplomas were awarded to eighteen members of the machine shop school and to seven students of the electrical shop.

**Industrial Pageant.** The vocational schools of Albany, N. Y., closed the year with a pageant of industrial progress. The progress of industrial education since early Puritan times was depicted, each character being attired in appropriate costume. Different types of activities of the boys' and girls' vocational schools were shown. There were fourteen graduates at the girls' school and five at the boys' school. In addition to these a number were graduated from the special courses in machine shop practice, printing, carpentry and cabinet making.

**Printing School Graduates Twelve.** Twelve students were recently graduated from the printing trade school at Cincinnati, O. Supt. R. J. Condon, in speaking at the commencement exercises, declared that Cincinnati had set the standard for vocational schools of the country in its printing trade school.

**Apprentices in Building Trades.** At a meeting of organized labor and employers in the building trades of Essex County, held at Newark, N. J., May 7th, an agreement was entered into whereby apprentices in the carpentry trade may be required to attend vocational classes in the public schools for four hours a week, twenty weeks each year. Employers will pay apprentices for the time spent in school. The minimum age of apprenticeship is 17 years and the maximum 22 years. The normal term of apprenticeship will be four years but the period of training may be reduced by satisfactory prior training.

**Cooperative Courses Discontinued.** The part-time cooperative courses at the Brooklyn Manual Training High School have been discontinued, and the students have been transferred to the technical division of the Brooklyn Technical High School. The change centralizes the cooperative vocational work in a school where technical courses are offered.

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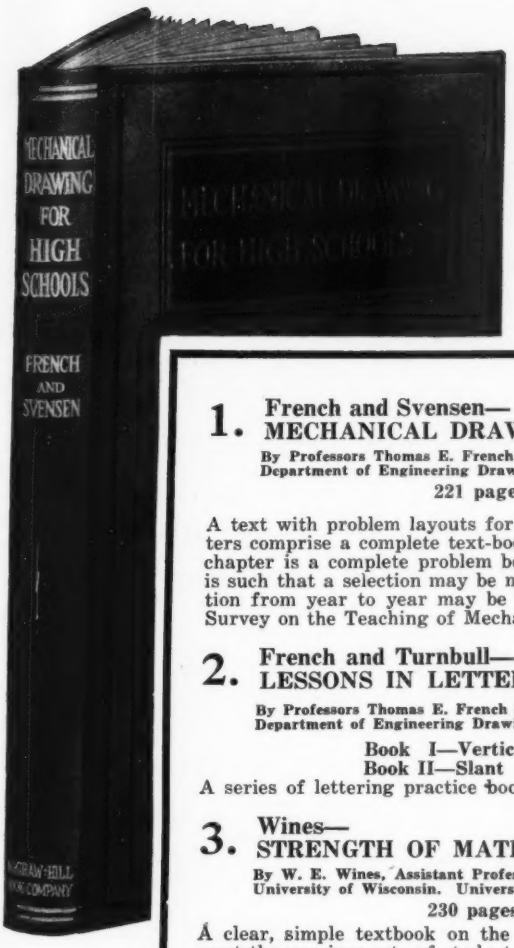


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A text with problem layouts for a two-year high school course. The first seven chapters comprise a complete text-book which may be used with any problems. The eighth chapter is a complete problem book in which the number of problems in each division is such that a selection may be made for students of varying ability, and that a variation from year to year may be had. The book is based on the findings of the Ohio Survey on the Teaching of Mechanical Drawing in High Schools.

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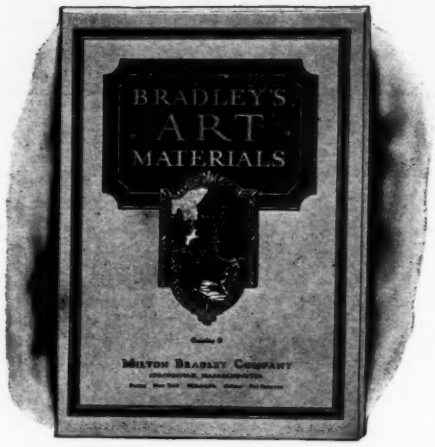


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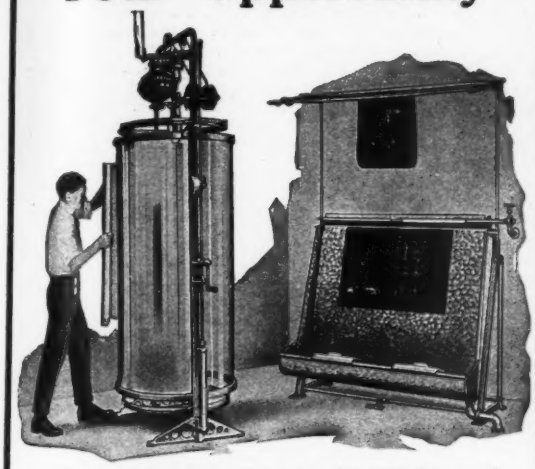

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(Concluded from Page XXVI)

**Honoring Craftsmen and Industrial Designers.** An interesting inquiry has been issued recently by a committee interested in the advancement of craftsmanship and industrial design. It seeks to learn the names of persons and organizations which are doing something to promote the public acknowledgment of men and women who are improving American industry through their skill of hand or power of design.

It is the purpose of the committee to learn whether there are in the United States individuals and organizations which are willing to cooperate in obtaining for American industrial artists that recognition which has been given to similar artists in France, England, Germany and other European countries. Its ultimate purpose is to place the American art industries on a plane which will bring them the recognition that has come to the pottery industries of France, the glass industries of Bohemia, the graphic arts industries of Germany, etc.

**Vocational Training** in electricity and automobile mechanics for high school manual training students, and in dietetics and millinery for high school girls has been announced to be available at the Middletown, O., high school, by Superintendent of Public Schools, R. W. Soloman.

To date, nearly 20,000 men and women mutilated or disabled in industry have passed through the rehabilitation offices of 34 states. The Federal Board for Vocational Education reported at the end of the fiscal year 1921-22 a total of 17,089 cases of disabled persons handled by the rehabilitation agents during the year; 15,407 of these cases rerepresented now registrations for the year. Officials of the Federal board declare that the states ar now beginning to feel the real momentum of growth. Last year the new registrations showed an increase of about 300 per cent over 1920-21. At the close of 1921-22 the number of cases on the live rolls was 8,147. In July, 1923, six months later, it is reported that they have amounted to 15,000.

**Teach Agriculture.** A total of 131 high schools of the state of Ohio are offering four year courses in agriculture according to the record of approvals on file in the state department of education. This represents a net increase of eighteen over the previous year.

**Offer Industrial Film.** "The story of fire clay refractories" is the title of a new motion picture film just issued by the Bureau of Mines, Washington, D. C. The film was prepared in cooperation with the Laclede-Christy Clay Products Company of St. Louis and is of especial interest to the vocational departments of schools and colleges. The film presents the complete operations of mining clay and of manufacturing fire clay products. Very interesting pictures are presented, showing the application of clay refractories in forges, electric furnaces, glass making, and in the automotive industry, etc. Complete details about the loan of the film may be had by addressing the U. S. Bureau of Mines, Pittsburgh, Pa.

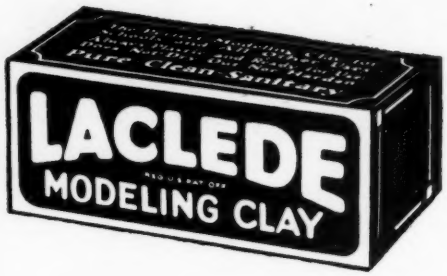
**Purposes of Projects.** The purposes of vocational agricultural projects are eight-fold according to Mr. George Butler and C. R. Snyder of Delaware.

While the aim of a project will vary with the type of project, the following aims were givn as typical of all projects:

1. To offer educational development to the boy through agricultural activities.
2. To offer an opportunity for the correlation of the practical and the theoretical.
3. To motivate and vitalize the study of vocational agriculture.
4. To furnish an opportunity for a remunerative activity.
5. To develop manipulative skill.
6. To develop a keener appreciation and the proper attitude toward farming as a vocation.
7. To give the individual student an opportunity for individual development.
8. To train for farming.

**Cornelius Abbott** of Indianapolis has been made teacher of industrial arts in the Columbus, Ind., high school.

**Miss Genevieve Fisher,** federal vocational expert, has been appointed to the staff of the Margaret Morrison Carnegie College, Pittsburgh, as professor of vocational home economics in teacher training. Miss Fisher was for five years in charge of household economics teacher training at Iowa State College, and was for three years with the Federal Vocational Board as agent in vocational home economics work.

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## NEW BOOKS.

**Dairy Farming Projects.**

By Carl Edwin Ladd. Cloth, 327 pages, illustrated. The Macmillan Company, New York, N. Y.

This handbook outlines a series of practical projects in dairy farming to be carried out during a year's time and offers a series of class and laboratory studies in dairy and herd management to be carried on simultaneously with the field and barn work. The work is intended for Smith-Hughes classes but is useful for any dairy farmer.

**Tables for Technical Mathematics.**

By Harry M. Keal, Nancy S. Phelps and Clarence J. Leonard. Cloth, 85 pages. John Wiley & Sons, Inc., New York, N. Y.

This book includes a series of (a) the commonly used mathematical formulae; (b) decimal equivalents; (c) logarithms; (d) trigonometric functions; (e) logarithmic functions. The work is a supplement to the authors' series of technical mathematics.

**Principles and Practices of Up-Keep Painting.**

Cloth, 200 pages. Price $2. Prepared and Published by E. I. du Pont de Nemours & Co., Inc., Philadelphia, Pa.

While this book is largely an argument for the use of prepared paints and varnishes in general, and for du Pont products in particular, it contains much technical information not readily found in one book and will be of considerable service to teachers of painting and wood finishing. The book covers the entire range of finishing and refinishing wood, metal, cement, plaster and other surfaces and gives specific directions for selecting paints, preparing surfaces, applying the paints, and caring for the completed jobs.

**Textile Fabrics.**

By Elizabeth Dyer. Cloth, 352 pages. Price $1.75. Houghton Mifflin Co., Boston.

Here is a book which provides studies in textiles more particularly for those who have to deal with them commercially. It not only tells about cotton, wool, silk and flax, their origin and peculiarities, but also how to approximate their value, and how to select more wisely.

It provides the salesperson with information that will enable intelligent service to the customer. The student is also told of the relative and changed values of materials as they undergo the processes of perfection from the raw article to the finished product.

**Descriptive Geometry.**

Lawrence E. Cutter. Cloth, 8 vo., 244 pages. McGraw-Hill Book Co., New York.

In this work the principles of descriptive geometry are applied by the method of choosing new projection planes, rather than rotating all lines and planes into one projection plane. The author has found from practical experience that the draftsman and the engineer can work far more rapidly by choosing new planes. The theory in the book has been condensed into four principles and these are illustrated in a series of detailed solutions of problems and are supplemented with practical problems taken from mining, civil and mechanical engineering and architecture.

**Analysis of the House Carpenter's Trade.**

Leslie G. Stier. Published at Berkeley, California, by Division of Vocational Education of the University of California and the State Board of Education, Berkeley, Calif.

This publication is in two parts. Part I carries statements covering the number of carpenters in California, wage conditions, trade organization, and trade entrance qualifications. There is a discussion of the types of courses in which trade content is taught. Part I also describes clearly how the analysis was made and has a well presented statement on how to use the analysis. A list of reference books on carpentry is given.

Part II consists of eight separate sheets 14"x17" on Roughing-in, Exterior Covering and Finishing, Roof Framing, Interior Finish, Stair Building, Foundation and Saw Filing, Estimating, and Record Sheet. With the exception of the Record Sheet, which is a blank form for record, each contains tabulated, analyzed, well arranged content under the following headings—Checking Level, Type Job Specifications, Objective, Trade Mathematics, Trade Drawing, Trade Science, Auxiliary Information.

For those who are interested in the teaching of carpentry, or work allied to carpentry, this bulletin will prove interesting and useful. The content on the tabulated sheets is conveniently arranged for the teacher. The bulletin will be of professional value to all who are in vocational education work.

# The Vital Purpose of School Art

*by*

***Clara P. Reynolds***

***Director, Department of Fine and Industrial Arts***
***Public Schools***
***Seattle, Washington***

TWENTY years ago, art in the schools was primarily cultural—the lessons were planned to develop the skill of those it trained, especially those with talent. Teacups, books, landscapes, birds—all were drawn for the purpose of learning how to draw—not to meet any particular need. Any direct value was for the "few."

The teaching of art today touches closely the needs that have to do with the homes, the dress, and the business of those it trains. It is therefore for the "many."

The old way did not help us materially to costume ourselves in good taste; to furnish our houses with rugs, hangings, tables, and other furnishings well designed and in harmony with each other; nor did it enable us, through such study, to demand more beautiful as well as useful products in every field of industry.

With this newer study of art for definite purposes, are being developed high common standards of beauty in form and color. Today, we do not discard the old thought of "drawing." We give it new purpose; we limit it to work having genuine motive.

We may need several drill lessons in drawing a teacup in order to draw it well enough to use in a poster advertising hot chocolate, or we may find, after attempting a poster setting forth the advantages of living in a certain country, that we should study the character of the mountains and the trees, and then return to the problem of the poster.

When children find that they need to draw houses, trees, chairs and tables in illustrating their stories and activities, then they have the "purpose" which urges them on to drill on the drawing of these things.

In the same way, the form and characteristics of different birds may be studied to suggest designs for a lamp shade, or to illustrate booklets on Bird Life.

School art today needs the active support of every person interested in education that all the children in every school may have the opportunity to share in this thoroughly practical art education.

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## PUBLICATIONS RECEIVED.

**Souvenir Folder reproduced** by the Vocational department of the Johnstown, Pa., schools. This interesting pamphlet includes a series of poems by famous authors. The material appeared originally in the School News, the grade paper printed weekly by the school print shop. The pamphlet is a very creditable bit of work.

**Booklets and Mottoes.** The Claremont School Print Shop at Public School 42, the Bronx, New York City, is one of the grade school shops which may always be looked to for artistic specimens of mottoes and small brochures. Not only is the typography in good taste and the color work harmonious, but every job has distinct educational merit and expresses some value which makes it worth keeping by the pupil. A recent collection of "jobs" which has reached the Industrial-Arts Magazine office includes a brochure entitled "Impressions" consisting of original verse by members of the Poetry Club of the school. Another splendid pamphlet contains an historical account of "The Beginning of Books." The title of another pamphlet is "Impressions of My Summer Vacation," a combination of calendar and diary in which pupils and teachers may record happenings of the 1923 summer vacation period. The Claremont School Press is to be congratulated on its productions.

**Part Time Cooperative Industrial Education.** Trade and Industrial Education Bulletin No. 1, State Department of Public Instruction, Harrisburg, Pa. This bulletin prepared by Dr. F. T. Struck, outlines the organization and administrative plans recommended for city and borough districts of the state of Pennsylvania. In addition to a general discussion of the problems, it recommends specific methods for housing and equipping departments, outlining courses of study, supervising instruction, certificating and hiring instructors, financing courses, collecting records and making reports, etc.

**Part Time Cooperative Education.** Its organization and administration. Pennsylvania State Department of Public Instruction, Harrisburg. Plans, courses, forms, laws, records, etc. Copies available.

**Development of Plans for the Preparation of Teachers.** Industrial Education, Circular No. 17, U. S. Bureau of Education, Washington, D. C. This bulletin contains a summary of proceedings of the conference of men engaged in the preparation of teachers for manual arts and industrial education held at Madison, January 11-13, 1923.

**Materials for School Shop Instruction Purposes.** Mr. Edward Wendels, Jr., in charge of Related Subjects at Altoona, Pa., has issued a most valuable list of materials and instruction booklets and other literature which manufacturers of various products have supplied to the Altoona Continuation School. The list is valuable in suggesting a wide variety of materials and literature on common articles of covers, on materials and methods of manufacture.

## STOUT INSTITUTE SUMMER SESSION.

A nine weeks' summer school has opened at Stout Institute, Menomonie, Wisconsin, with an enrollment of 250 students. The attendance which is the largest in the history of the summer sessions, has been accommodated by additional sections of professional and academic courses, together with new shop equipment and apparatus.

A number of changes and improvements have been made in the various shops. The print shop has added a linotype and intertype. The sheet metal shop has been given increased floor space and the shop benches and machines rearranged to facilitate routing of the work. The wood working shop has been rearranged to give additional space and light. A general shop for work in home mechanics has been equipped on the second floor of the industrial arts building where projects in the mechanical maintenance of the home may be carried out. A course in radio has been provided with work in construction, assembling and installation of projects. The forge shop has been provided with new forges, while additional space has been given to the subject of automobile mechanics. The latter change enables the handling of automobile electrical work by itself, leaving the first floor shop for work on motors. The departments of brick laying and concrete work have also been given additional floor space.

In the building line, two sections in carpentry have taken over the construction of a dwelling house for a local resident, also the building of a double garage. The latter will be completed this summer.


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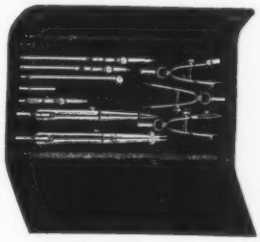

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## NEWS OF THE MANUFACTURERS.

**Teaching Linotype Operation.** Schools which have undertaken the teaching of linotype and monotype operation have always experienced difficulty because of the lack of equipment. The number of machines available for teaching keyboard manipulation has never been sufficient to give every young man time to learn proper fingering and to practice it for a sufficient length of time to make absolutely correct fingering absolutely automatic.

The Empire Type Foundry of Buffalo has just placed on the market a machine which will make the teaching of keyboard manipulation simple and economical. It is a linowriter—a modified form of typewriter, with a linotype keyboard. The machine may be used with complete assurance that the person who operates it with speed and accuracy, correct fingering and correct use of the spacer, line shift, etc., will be able to handle a slug-caster keyboard with equal facility and success. The machine may be used for any ordinary typewriting. Circulars are available.

**New Niagara Catalogs.** The Niagara Machine & Tool Works of Buffalo have just issued three important catalog bulletins of interest to sheet metal workers. No. 63 illustrates and describes in detail the Niagara straight sided single crank power presses (series No. 50) and the Niagara Trimming Presses (series No. 50T). Bulletin No. 64 shows the entire line of Niagara double crank power presses of the No. 60 series. Bulletin No. 65 is devoted to the Niagara double crank power presses of series No. 70. Each bulletin contains complete specifications and detail descriptions of the use of these machines, which are all intended for heavy duty, quantity production.

## PERSONAL NEWS.

**Mr. James C. Tucker,** for the past four years director of vocational education at Bethlehem, Pa., has resigned to become supervisor of prison industries under the state welfare department.

**Mr. M. M. Walter,** of Coatesville, Pa., has been appointed to succeed Mr. Tucker at Bethlehem.

**Mr. Ernesti Promoted.** Mr. Richard Ernesti, who has been head of the art department at Drake University during the past three years, has been elected director of art in the public schools of Colorado Springs, Colo. Mr. Ernesti was for many years active in education in Colorado, which state he calls his native state, and up to 1918 was in charge of the art department at Pennsylvania State College. He will have entire charge of art instruction in the elementary and secondary schools of Colorado Springs under the superintendency of Mr. F. H. Bair.

**Mr. H. N. Barlow** of Milan, Mo., has become a teacher of vocational agriculture at Lexington, with an increase in salary.

**Mr. Charles H. Stone** has been appointed instructor in manual training and mechanical drawing in the high school, Elsinore, Calif.

**Mr. W. S. Cawthorn,** state superintendent of public instruction of Florida, has taken over the state vocational work formerly in charge of Shelton Phillips. The change has become necessary through the failure of the legislature to provide funds for the maintenance of the office of state director.

Under Mr. Cawthorn's direction, uniformity and simplicity will be emphasized. Supervisors operating under the Smith-Hughes law, have been asked to keep cumulative records showing maintenance costs of the work. They are also asked to keep records of travel, communication, administration and data on classes under the direction of the supervisors.

**Mr. Frank R. Morey,** supervisor of school gardening under the bureau of vocational education, of the state education department, Harrisburg, Pa., has been awarded the degree of master of arts at Columbia University.

**Mr. L. Day Perry,** instructor at the Lane Technical High School, Chicago, has been given a leave of absence by the Chicago board of education to undertake temporarily the supervisorship of the Industrial Work Shops, a rehabilitation experiment conducted by the Jewish Social Service Bureau. The shops are operated by the Bureau as a means of economic relief to the entire Jewish section of the city. They furnish employment to men and women who do not fit in the industries and they offer training for those who may eventually be placed in industrial shops. It is the purpose of the Bureau to salvage the social waste in the community and to provide a solution of the problem through opportunities for work.

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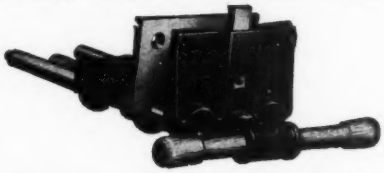

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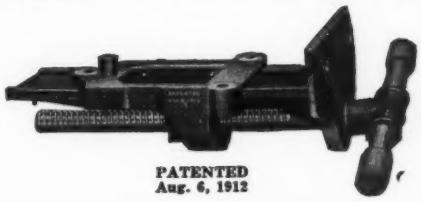

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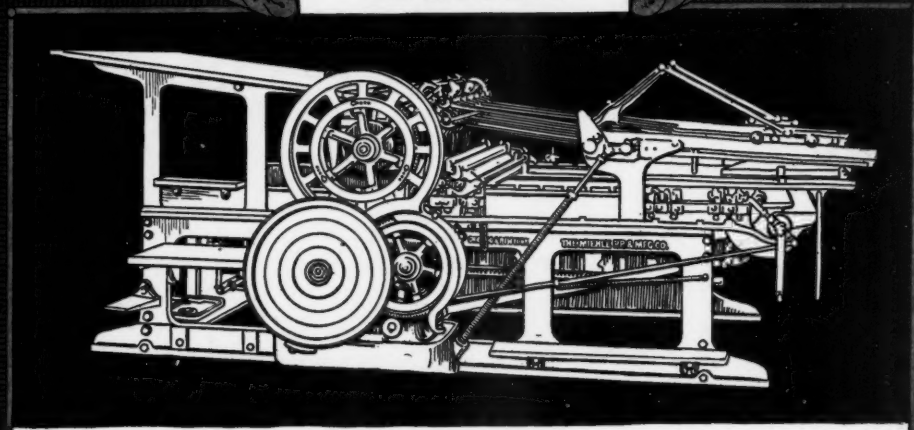

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